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—EDITED BY—

F. J. S. GORGAS, M. D., D. D. S.

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ARTICLE I.

THE TEETH OF CHILDREN.

BY DR. W. GEORGE BEERS, OF MONTREAL, CANADA.

Once upon a time I thought I knew something of the predisposing causes of dental caries; but the more I read and observe, the more disposed I am to change dogmatic points of exclamation for modest marks of interrogation, and to sit as a humble hearer rather than to pose as a presumptuous preacher. Indeed, I now know that I know less than I was sure I knew when I was in my first year of practice. In respect to the increasing decay of children's teeth, I feel every day such a growing degree of ignorance that I expect soon to exclaim with the ancient philosopher in search of knowledge: "All I know is that I know nothing!" It is amazing how the omniscience of a newly-fledged dentist disappears as he gets riper experience. Dental theories in science and practice, like the toy blocks of children, seem in our day to be set up only to be upset. Thought, which one crept, now flies so fast,

"We think our fathers wrong, so wise we grow;
Our wiser sons no doubt will think us so."

I have a very keen sense of the risk I run in speaking here upon a subject so trite, but I venture to do so that I

may get, not that I expect to give information and because I believe that it is a subject of the gravest importance, even should it be sneeringly treated as "milk for babes." I cannot, after the open confession that I have made, expect to tell you anything new, but, as Seneca says, "a thing is never too often repeated that is not sufficiently learned." Moreover, if we all wait till we are able to contribute something purely original, many of us will never contribute anything; and if we are debarred from the discussion of subjects familiar to us all, we may rarely discuss anything, because everything seems to have been discussed.

It is probably a perfectly safe estimate to make that in American and Canadian cities of fifty thousand people not a hundred native-born can be found between the ages of four and fourteen who have wholly escaped caries and premature loss of some of their teeth. If this ravage was to proceed in the same ratio, men and women would be edentulous by the time they were forty, were it not for the preservative skill of the dental operator. It is a fact we must recognize that, were it not for the services daily rendered to humanity by our profession in this country, the largest proportion of the adult population would be comparatively toothless. Is it not becoming identically the same with children, so that we may say, were it not for the services daily rendered to them, the largest proportion would lose at least the deciduous molars before they were five years old, and the sixth and twelfth-year molars before they were fourteen? In fact, so common is the disease, even in Canada, that it has long been one of the popular superstitions we should aim to destroy, that the decay of children's teeth is as much to be expected as their eruption; and the children themselves have been largely educated by bitter experience to look upon it as a fatality of childhood; and may reason about it after the manner of a curious epitaph over the grave of an infant:

"Since I was so quickly done for,
I wonder what I was begun for."

Supposing it could be proved that in our public schools the lobe of one ear, or the little toe of one foot, of every tenth child were becoming tender to the touch and diminishing in size, would it not cause dismay? Would not the public mind be agitated to deep inquiry if it were found that the hair of every tenth child was turning gray, or that crow's-feet were marking their lines about their eyes? And supposing on the ear, the eyes, and the hair, at birth, there were visible indications, such as there are so often at the eruption of the teeth, which predetermined decay, would we be satisfied with mere investigation of the exciting causes, or would we not feel bound to search for causes in embryo in such a coincidence? Caries of the teeth means decay—death—as much as the graying and loss of the hair. Why should any part,—the teeth any more than the hair,—decay and die prematurely? Has it come to this, that we must accept early decay as an inevitable coincidence of their existence? Are we to believe that the teeth are the unfittest part of the body to survive, and that this trade-mark of death is impressed on the very embryo, and is to be carried in the mouths of otherwise healthy children from the time of their eruption?

I have long since lost all surprise and wonder why the teeth of adults decay. The surprise to me is how so many escape. What boots it if the wisdom tooth should become rudimentary in civilized races? What good is it? Why should we break our hearts over the caries of the teeth of adults who have preventives, preservatives and substitutes, and think or do so little for those of children who are not able to suffer like adults, and who certainly cannot have the loss of natural teeth supplied? The only sincere surprise and pity I have left is for this caries of irresponsible children. Even the woman who expects pregnancy can make preparations against coincident or consequent dental affections. Half of the men who suffer disease and loss get just what they deserve. But it is not so with children, and I am anxious to have my gross ignorance enlightened, even at the

cost of abandoning strong convictions. There must be something for mother, child, dentist, and physician to do which is not done.

The average baby is born into the world as toothless, though fortunately for its teething not so tough, as a turtle. Every other feature is presented in a recognizable form, pretty much as nature premeditates, whether perfectly or imperfectly developed. One can tell fairly well if the little bit of humanity is to have its mother's eyes; or, in spite of the preternatural snub, its father's nose, or if it is to be a new departure, or an old revival of the ancestral physiognomy. Whatever physical defect of eyes, palate, lips, or extremities is inflicted upon the child, whether congenital cataract, cleft-palate, hare-lip, or club-foot, may be detected at birth. Nature, however, loves the darkness in dealing with the teeth. She might have grown the teeth as soon as the eyes, and she might have put guards about a woman's nipples. We know the wisdom of the arrangement as it is; and one would suppose that the very invisibility in which she keeps the teeth would provoke more inquiry as to their healthy future. I know women who became physiologists when they became mothers; who went to work to study how the coming teeth were to come, with as much interest as they had ever studied the harmony of colors, or the superiority of wood or woolen for carpets. So it should be in every case. But I am not sure that parents would not learn more and care more about the teeth were they born like those of Marcus Curius, the Roman consul, who Pliny states had a full set at birth. Yet it is a fact that in many cases they are no sooner into the world than they are into trouble. Nature, as I said, forms them in the dark; and there, after birth, they lie in their secret chambers for the first five months, a hidden foe to the mother's rest and the little owner's peace; the puzzle of the ancient physiologist, who thought the pulp a worm; the despair of the old Greek pathologist, who attributed all infantile mortality to teething, and who declared that the cause of toothache "is known only to God."

When we consider that nature is busy at work long before birth constructing the second set of teeth; that the enamel-organs of the first permanent molars appear about five months before birth, those of the second molars three months before birth, and those of the *dentes sapientiae* fifteen or sixteen years before they erupt; that a child has, from its fifth year to the eruption of its first molar, forty-eight developed teeth, or the calcified germs of teeth in its jaws, and that the structural condition of both temporary and permanent is determined in embryo, we ought surely to realize the importance of study in this direction. If we accept the acid theory of caries, and especially associated with the softer character of the dentine and enamel of the deciduous teeth, we may assume that there is no more mystery as to the exciting causes in the teeth of children than in those of adults. But healthy children, from two to seven years old, have not lived enough to be exposed to the principle exciting causes of caries. Or must we declare that, just because of the softer character of their teeth, the exciting causes are more active? But, again, they are in the period of growth; nutrition is most energetic. Why is this period associated with decay? Allowing that in modern habits of life and diet we may find immediate causes, these have nothing to do with structural conditions (and it must be admitted that predisposing causes and conditions exist, for which the child is in no way responsible). I would throw the main responsibility upon the mother, given that there is no existing or hereditary disease on the part of the father; and accepting the disturbance of the nutrition of the teeth during the intra-follicular evolution as now a very common coincidence, would seek in that direction for the first, and, most often, the only predisposing causes of caries. It would seem, too, as if in certain maladies the condition of enamel is invariably disturbed. So true are the embryonic and pos-natal result of certain condition of the mother and child, that it seems to me that until we have defined and laid down in some specific way the attendant

risks to which tooth-development is subject, and discover how these risks may be governed, we are studying predisposing causes very much in the dark. We know that the breed of lower animals and the quality of plants and flowers may often be altered and improved. Is this to stop at mankind, or can we in any way influence the vital forces which govern the rudimentary genesis of the embryo and of the teeth? Can we do anything to secure molecular perfection; to feed germs; to prevent intra-uterine disturbance; to grow good teeth, as we can grow good geraniums? Have we any control of the embryo through the mother? Can we control nutrition,—assimilation,—or are we to abandon that idea, take the teeth as they come to us in their steady decadence, and make no effort to grow better? Is dentistry to confine its science to its practice, or is there a day to dawn when the embryologist will be consulted, as the architect or the builder; and the teeth will have become so bad that he will find large occupation in studying the idiosyncrasies and habits of people who intend to marry, or who are just married, and advising and prescribing diet, habits, etc.?

Of late, there seems to be a disposition to question the value of administering phosphates during pregnancy and the formative period of the teeth. It is important to know if the system will resolve and appropriate certain elements to different uses; to know if it will take up phosphate and carbonate of lime and magnesia, and direct them to the growing teeth. Nothing establishes truth like attacking it. It will stand if it is truth. So let us pitch into truth just to make it shine out. If what we have supposed to be truth is only fraud in disguise, the sooner we know it the better. It was a very hard pill for the old anti-amalgamites to swallow when they had been trying to believe the black coating on the old material to be an injurious preparation of mercury, instead of what it was, an innocuous preparation of silver; in other words, that they had been trying to believe what they wished were true. Now, unless some-

body can upset better than that what many of us believe as to the value of the phosphates, by giving analytical proof from actual experiment performed upon pregnant women and the fetus at various periods, or at least upon the lower animals; unless some one can substantiate doubt by physiological and chemical proof that the formative period and the pregnant condition as regards the teeth cannot be modified by special nutrition, I venture to believe that we possess sufficient evidence to warrant the theory that lime, furnished in such forms as will be easily digested and assimilated, does contribute to dense development and perfection of tissue. Is there anything unscientific or unreasonable in the assumption that we can feed the germ through the blood of the mother, when we know that through the mother's blood the embryo is fed? And have we not analogous evidence in the animal and vegetable kingdoms to assure us that our creed is not founded upon guessing?

Chemical analysis tells us what it is that gives the teeth their superior hardness over the bones, and what their condition is when they are defective. It seems to be the conviction of histologists that once the enamel is formed it cannot be modified, as may be the dentine, which becomes denser by age. The structural character of enamel is, it is said, unchanged and unchangeable, except by external causes. We may not know all of the truth yet in this matter; but we know that in the development of the fetus lime is abstracted from the tissues, and especially from the teeth, of modern mothers, and that this alternation in the latter goes on in the dentine so as to predispose the unchangeable enamel to some alteration, whether structural or not. Do you not think that indirectly the enamel may be influenced through the blood of the mother, by the administration of the lime-salts which are absolutely necessary to its nutrition? It seems to me we know a good deal to encourage us. Chossat's experiments proved that by abstracting lime from food artificial softening of the bones

in animals can be produced; that life will not be sustained if food is deprived of its phosphates. We know that rickets, scrofula, and many other diseases, even difficult dentition, owe some of their origin to the deficiency of lime and magnesia. We know that, during gestation and lactation, the phosphates and carbonates are usually insufficient for the demands of the mother, and every day we see the result in the softening and decay of her teeth. At no time of life are these so urgently needed as when to lives—one in embryo—have to be supplied through the one channel. We know that if we keep lime from fowls they will have eggs without shells; that cows fed on land sown with bone phosphates will give richer milk; that wheat, planted in earth deprived of phosphates, will die soon after its germinates; that we cannot get flowers on peas which are sown in a soil containing no phosphates. We might confine this argument entirely to facts known as to animal life and diet; and, knowing all we know, though having to admit much ignorance, may we not continue to preach to our patients the gospel of lime? Is it not a fact that the debility from which so many pregnant women suffer is due to the waste or lack of this element, and that the evidence is more than circumstantial that direct and rapid changes have been induced by its supply? If I knew enough, and had opportunity, I would like no better way of experimenting than to begin at conception, and test in a thousand cases the influence of lime upon the coming child as well as the mother. If what we know, or what we hope to know, is to be of any practical value,—and knowledge that cannot be made practical is better unknown,—we must do what we can do in the early months of pregnancy.

While we cannot, then, weigh out earthy phosphates by measure and expect them to be digested and assimilated as readily as water will be absorbed by a sponge, we can expect this from such preparations as the syrup of lactophosphates,* as well as the easily assimilated diets which

*One tablespoonful every day for a month, then discontinued for a month, as advised by Dr. Cushing, Chicago.

contain them. Every day the phosphates and other salts are excreted by the perspiration, the fæces and the urine, and in the latter especially there is a large excretion as a coincidence or consequence, perhaps of pregnancy. This does not imply that lime-salts are too abundant. It does not mean lack of nutrition or assimilation of the existent element, but a natural process; not an excess but a waste of matter which has become incompatible with digestion; and instead of indicating that the system has too much lime, or will not appropriate what it has, it shows a direct need for it. Blacke, of Paris, in experimenting upon the action of the phosphates, submitted a pigeon to the test of food in which they were absent. Its appetite, weight, and activity were diminished, and the fact may be noticed that it excreted more phosphates than it absorbed. The rapid loss clearly indicated the need of lime-salts, and when these were furnished they were assimilated, in spite of the quantity being excreted, and the pigeon regained its appetite, weight and activity. In face of the evidence we possess, it would be a disastrous theory to propagate the idea that diet has no direct influence upon the origin as well as the development of the teeth. The consulting embryologist of the future will go further. He will at least do as much as the Grecians did, by keeping his patients under the impressionable influence of art, music, and sculpture. The medicines for the mind will be as much investigated as those for the body; the value of sunlight and sun-baths, of scrupulous cleanliness of body and repose of mind,—the antidotes to modern nervousness. These will be made to contribute to the growth and development of the embryo. We live in an age when the most amazing revolutions in science and discovery are received with almost perfect complacency, and it would not startle us if some modern Alphonso of Castile, who said he could have made the world better had he been consulted, would really demonstrate his ability to improve the human embryo.

I would like information upon one point. Anyone who has examined the deciduous molars previous to eruption

may have found structural defects,—fissures in the grinding surfaces that look exactly like fissures found in the same teeth erupted for months. Of course, this examination must be *post mortem*, so far as the human teeth are concerned; but the investigation might be made upon dogs by vivisection. The frequency of caries in the first permanent molar, especially in the lower jaw, has been shown by Magitot: in 10,000 cases, to exceed that of any of the other teeth; while in 1,000 cases in the temporary set the same tooth in the same jaw is most frequently carious. Our lamented friend, Dr. T. B. Hitchcock, published in the *Canada Journal of Dental Science*, in 1871, a comparison of this table, prepared from his own record of 10,000 cases. While it varied in some respects, its conclusions were the same with reference to the greater frequency of decay of the lower first molars. Several theories have been proposed to account for this fact, the most popular being that the period of intra-maxillary evolution of these teeth is so prolonged and coincident with a period most likely to be disturbed by diseases,—in the case of the deciduous teeth, of the mother; in the case of the permanent, of the child. With our present knowledge this seems reasonable. But if we consider the character of the superimposed gum, which for months before eruption is tense and inflamed, can it be possible that, as the result of the local irritation, the normal character of the mucus obtains an acid reaction, and that this and other acids may reach the crown of the undeveloped tooth, and slowly act upon the lime-salts of the enamel in imperfectly calcified fissures? Nasmyth's membrane would not protect the fissures, because we now know that it can be penetrated by acids. It is easy to understand why acids would thus act in the fissures of molars when it would not in the smooth surfaces of the other teeth. The condition of a child's mouth in febrile states of the body, the irritation peculiar to that part where so many teeth are growing, must vitiate the buccal fluids. I was surprised, in testing the saliva of nursing children before the eruption of the teeth,

to find a decided acid reaction in every case. Infants do swallow every particle taken into the mouth. The cheeks, the maxillæ folds, the tongue, retain portions of soft food, and these sour and become acid. One of the national customs among the French Canadian peasantry is to put a small cloth bag of bread and sugar, soaked in milk, into the mouths of infants to keep them quiet. Frequently the result is to cause vomiting and an excess of acid in the stomach. I doubt if it is generally realized to what extent acids are present in the mouth before the eruption of the teeth. Now, I venture to believe that just as easily, if not more so, as iodine and aconite painted on the gums can reach and act upon the periosteum, these acids can reach and act upon the crowns of the undeveloped molars.

As I propose in a future paper, with your permission to discuss the specific result of the diseases of pregnancy and infancy in their effects upon the teeth, I will not allude to the subject here. To my mind, neither physicians nor dentists will ever do all that could or should be done. It remains with the mothers to learn more about the origin and development of the teeth, and to take as much interest in the embryology of their future offspring as they do in house-plants which they grow from the seed, or as some do in the breeding of pug dogs.

The care of children's teeth after eruption ought to occupy more attention. It falls naturally upon the mother; but it ought to occupy as much of our thought as treatment. Every one of has seen hundreds of disheartening cases; children of eleven and twelve years having twenty or more carious cavities in the teeth,—that discouraging decay between the lower incisors which marks caries of embryonal origin. It is remarkable how the large proportion of these cases can be traced back to disturbances and diseases during pregnancy, or in the early months and years after birth.

One of the best means to make parent and child value the teeth which should last forever is to make them realize

the importance of those which should last for six or seven years, during which time the child is entirely dependent upon them for mastication. Every mother ought to know the process by which the deciduous teeth are removed by nature. My experience is that most parents think they are shed as a canary gets rid of its feathers, or a deer its antlers; Some imagine that they are lost as a crab looses its shell or that it is a process of moulting to be continued at intervals during growth, like that of the lobster. People are prepared to believe anything about anything of which they know nothing, and they ought to be surprised by being taught the truth.

The popular superstition that the deciduous teeth are only of temporary importance, and that their premature loss is only one of appearance, not of function, like all superstitions, was founded upon ignorance, and is receiving its death-blow in this country. But, as a rule, the first eight or twelve years of a child's life is too often a time of neglect, so far as the teeth are concerned; and if there is any time when every tissue and organ should have the utmost care, it is when they are in rapid growth, when vitality depends upon what goes into the mouth, and from the mouth into the stomach. As a rule, children are never taught the object of their teeth and the need for their exercise. Example in this fast age of quick eating is rarely given, for it may be said of most of us, as Plato said of the citizens of Agrigentum, "They eat as if they had not an hour to live." Mere eating is not mastication. Let this be the first idea of the function of the deciduous as well as of the permanent teeth,—That they are intended as human mills to prepare the food for digestion, and that as machinery rusts out quicker than it wears out, so teeth which are not exercised by mastication are more predisposed to decay than those which have plenty of hard food to grind. The lessons of hygiene are so simple that they are rarely observed, just because of their simplicity,—daily use of the badger-hair tooth-brush, percipitated chalk, and castile

soap. Mothers ought to have mouth-mirrors, and ought to examine the child's teeth every month of every year. I have seen children who have looked forward to the eruption of a tooth as a happy event in their lives. Why should not this be a life-lesson of pleasure to a child from the time it has intelligence enough to watch for its dental development? It is taught to take care of its hair, its skin, its nails, its toes, its eyes. A child's deciduous teeth are as much a work of the Creator and as important for the time being as the health of its hair, its skin, its nails, its toes, or even its eyes. If nature made any mistake, however, it was in giving us so many teeth that they are not only undervalued, but so easily replaced. If a child had twenty eyes and only two teeth, the custom which governs so many parents in the care of them would be reversed, especially if the twenty eyes were temporary, to be replaced by thirty-two successors, and the two teeth had to be carried to the grave. If we cannot grow better teeth for children, we must do more than we have yet done to keep the poor ones they have. Even in this direction, I feel we will never be able to do the best for their teeth until the great discovery comes with the permanent translucent soft filling. Children, even of an older growth, will then have one of the miseries of life ameliorated, and the structural poverty we regret will be met by some after compensation that will do much to lessen the need for prosthetic dentistry.

I should have concluded long ago, but I must do so now, and with reiterating my conviction of my own ignorance. Confucius has a fine thought: "What you know, to know that you know it, and what you do not know, to allow that you do not know it,—that is knowledge." I have tried to show you how little I know that I may the sooner know more. No doubt you will assure me that in this I have splendidly succeeded.—*New York Odontological Society proceedings.*

ARTICLE II.

THE ODONTOLOGICAL SOCIETY OF GREAT
BRITAIN.

The Ordinary Monthly Meeting of this Society was held on May 4th, Mr. Richard White, L. D. S. Eng., Vice-President in the Chair.

Mr. E. Lloyd Williams exhibited a model of the upper jaw of a lady, aged sixty, showing a large mass of hypertrophied gum tissue attached to the palate by a large flat pedicle. The occurrence of such growths in connection with the wearing of plates was not uncommon and this one was remarkable only on account of its size. The patient had worn a plate, retained by springs, for fifteen years.

Mr. Charters White remarked that such growths were often met with in patients who had been wearing for some time a misfitting plate. In this case the edge of the plate had evidently cut into and irritated the mucous membrane of the palate. He thought the best plan would be to make a plate to cover the whole of the palate, the pressure of which would soon cause the disappearance of the mass.

Mr. Browne-Mason (Exeter) exhibited models of the mouth of a girl, aged eleven, showing a remarkable malformation of the jaws. The upper jaw receded so that the incisors closed a quarter of an inch within the lower, and the only teeth which articulated properly were the first permanent molars on the right side. He should be very glad to receive any suggestions as to treatment, though he feared the case was incurable.

He also handed round a model which he had received from Mr. Parkinson, of Bath, showing unusually large and well-formed supernumerary laterals.

Mr. W. A. Hunt (Yeovil) read the following notes of

an instructive case of neuralgia coincident with the advent of the wisdom teeth:—

“A lady vocalist, some three years ago, suffered greatly from ordinary neuralgic pains on the right side of the head, affecting all three divisions of the fifth nerve, with pain apparently located in the first right lower molar. An irregular practitioner extracted this tooth, which he said was sound, but the patient experienced little benefit. Under the hands of her medical attendant, after a six month’s course of quinine, &c., the pain did, however, slowly abate, but only to return as badly as ever on the *left* side.

“She then consulted me, but, she said, with little hope of obtaining relief. Her age was twenty-eight, and her general appearance healthy, but the pain made her miserable. Her teeth were all well formed and regular, but seemed firmly compressed against each other. The right lower wisdom tooth only had been erupted, and on this side the first lower permanent molar had been extracted, as already mentioned.

“The advancing wisdom tooth must, I thought, have been the cause of her pain, and had the second molar been extracted instead of the first, relief would have followed almost at once, instead of taking nearly six months, and the expenditure of so much medical skill and quinine. I therefore examined the left side carefully, and by passing a fine probe through a little dimple in the gum, I felt the wisdom tooth beneath. I at once removed the second molar under gas; some relief was at once experienced. I advised her to discontinue all medical treatment, and in two or three days the pain entirely subsided.

“A year elapsed, and she again consulted me with the same kind of symptoms on the *right* side. Here I could see a presenting cusp of the upper wisdom tooth. I extracted the second molar and relief again followed.

“In six months’ time she again presented herself with the same typical pain on the *left* side, but more severe than ever. The most careful and prolonged examination failed

to disclose the slightest sign of the advent of a wisdom tooth, or even of its existence; yet from former experience, I, without hesitation, extracted the second molar under gas, and I have here the tooth for your inspection. The specimen clearly shows the injury done by the advancing, though buried, tooth; the distal half of the posterior buccal root and some of the crown have disappeared, and the nerve canal is completely exposed for more than half the length of the root. It was impossible to diagnose this till after the extraction. The operation was followed by immediate relief, and the patient is now absolutely free from neuralgia.

"I may observe that no signs of local inflammation or irritation were discoverable from first to last in this case. The treatment adopted of extracting a useful second molar instead of digging out the less useful third molar was, I believe, correct in this case. All four wisdom teeth were large, well-developed healthy teeth, and eventually took up excellent and useful positions.

"The case is instructive, as its history is so definite and complete, and strikingly illustrates cause and effect no less than four consecutive times in the same individual; and lastly, as illustrating the serious and unsuspected damage that a buried tooth can inflict by pressure against the roots of a neighbor which stands in the way of its progress."

The Chairman said Mr. Hunt's case, or rather series of cases, was exceedingly interesting. He thought that trouble of this sort from the wisdom teeth was more common than it was generally considered to be. At all events, he met with such cases pretty frequently in his own practice, and had almost come to look upon wisdom teeth as natural enemies, to be got rid of whenever an opportunity offered. Recently his son, Mr. Wentworth White, had asked his advice with regard to a gentleman, aged forty, who had for some time been suffering severely from neuralgia affecting the left side of the face. He had consulted another practitioner, who had extracted the second upper bicuspid, which was found to be sound, and this gave no relief. Mr.

White could find nothing wrong with the teeth on that side in the lower jaw, but on carefully testing the upper teeth, the second molar was found to be sensitive, and it was decided to extract it. It was then found that the pressure of the wisdom tooth had made a cavity on the distal surface. The patient obtained immediate relief.

Mr. J. S. Turner thought that most of those present must be familiar with such cases. The wisdom tooth, however, was not the only tooth which was capable of causing mischief of this sort. At the March meeting, Mr. White showed a lateral which had undergone very extensive absorption, owing to the pressure of a neighbouring tooth, and quite recently he had himself removed a lateral in in exactly the same condition, absorption having taken place to such an extent as to expose the pulp cavity, due to the pressure of the canine, which was coming down in front of it. A remarkable feature of the case was that the patient, a youth, said it had not caused him any inconvenience.

Mr. C. J. B. Wallis showed the skull of a Zulu; a very fine hippopotamus skull; the jaws of a sword fish (also a very fine specimen); and the jaws of a large extinct animal, which he believed to have been an ichthyosaurus, and had been dug up in Egypt.

Mr. Hutchinson remarked that the hippopotamus skull was a magnificent specimen, and begged Mr. Wallis to use his influence with the owner to induce him to present it to the Society. The skull then in the Museum was not nearly such a fine one.

Mr. D. Hepburn showed a model of the mouth and jaws of a young man, aged twenty-three, who had been treated at St. George's Hospital thirteen years ago for "fever." He had at the same time some necrosis of the jaw, and extensive sloughing of the soft parts. Cicatrization eventually took place, but accompanied by ankylosis of the lower jaw. The jaw was now practically immovable; he had not the slightest power of mastication, and only a very small aperture between the teeth on the left side of the

mouth. Contraction seemed to be still going on, for the upper teeth were being slowly forced outwards. In spite of his inability to masticate, the patient enjoyed very good health, and Mr. Hepburn did not feel justified in advising any operative interference at present.

Mr. R. H. Woodhouse showed a model of the upper jaw of a man, aged thirty-four, which had been sent to him by Dr. Walker. At the age of ten the right permanent central was broken at the cervical line by a blow from a stone. Abscess ensued, and the root was extracted three or four months after the accident. Three years ago, seventeen years after the accident, the right permanent canine showed signs of eruption. The permanent right lateral and temporary canine were firmly articulated.

He also handed round a model of the upper jaw of a young man, aged seventeen, which had been sent as a donation to the Museum by Mr. Adams Parker, of Birmingham. His first dentition was perfectly natural. With the second dentition a supernumerary tooth appeared to the right of the middle line; this became loose and was extracted, when a second supernumerary tooth appeared in the same position. It was firmly implanted and quite sound.

The Chairman then called upon Dr. St. George Elliott for his communication on "Bridge-work."

Dr. Elliott said the subject of his communication was one which had not as yet been often discussed at meetings like the present. Indeed it was comparatively a new subject. For although bridge-work was actually a new invention—he had himself seen fifteen years ago a good example of this kind of work in the mouth of a patient, and it had been in use fifteen years at the time he saw it—yet it was only during the last five or six years that it had come into anything like common use in the profession. Like other methods it might be carried to an extreme, and used without judgment in cases where a plate would have answered much better; still it was very useful in suitable cases. Patients were sometimes met with who had a very strong

objection to wearing a plate. Singers, for instance, found a plate very inconvenient; very nervous and irritable patients also not unfrequently objected to them. In such cases "Bridging" often afforded a satisfactory means of remedying defects.

It was sometimes asserted that bridge-work was likely to cause trouble, and do harm to the teeth which served as supports, owing to the difficulty of preventing accumulation of food about the parts; but this was a mistake. The work might and ought to be done in such a manner that no inconvenience whatever should arise from this cause, and perfect cleanliness could be maintained by the patient with less trouble than where a plate was worn.

He had prepared some diagrams which would illustrate some of the conditions under which this method of treatment might be beneficial. The first case he would mention was that of a German baron, who was first treated on this plan about five years ago by a dentist of Dresden. In this case the right upper lateral and canine had been fastened to the first bicuspid and central. The bar was attached at one end of the lingual aspect of the central by a gutta-percha filling, and was anchored at the other end to the bicuspid by a gold filling. It was evident that a considerable strain fell upon the central, and it might have been supposed that the gutta-percha stopping would have given way, but it did not. The work lasted two years, and then the lateral broke off from the bar. The patient came to Dr. Elliott in order to have the breakage repaired; he expressed himself as highly satisfied with what had been done, declaring that he had never had any comfort from artificial teeth until he had this bridge in place of a plate which he had previously been wearing. Dr. Elliott removed the piece with some difficulty, replaced the lateral, and refastened it as before to the central, only using gold instead of gutta-percha. This time it only lasted six months, when the central, to which the bar was attached, broke off. Dr. Elliott then cut down the stump of the central to the level of the gum, and attached

to it a porcelain crown with a gold backing by means of a screw pin and nut. One end of the bridge was then soldered to the gold backing, and the other carried to the bicuspid and securely anchored to it by amalgam. This had lasted well, and had given great satisfaction to the patient.

Some amount of judgment and experience was required in adapting this method to particular cases. As an illustration of this he would mention a case which had come under his notice. The patient had lost his right upper lateral, and to replace it the dentist had devitalized the canine and inserted a platinum wire in the nerve canal. This wire, after being anchored by gutta-percha, was bent at right angles, and had a lateral soldered to it. No protection was given to the canine other than that afforded by the gutta-percha, so that the tooth soon decayed and gave way, the bar bent under the strain of mastication, and the lateral was forced up into the gum. Dr. Elliott removed the appliance, cut down the canine to near the gum, and fitted on a gold-backed plate tooth, with a hole through the gold for the passage of a screw which was anchored in the stump by amalgam. The lateral was soldered to the pivot thus made, and on the mesial side of the lateral a pin was soldered which passed into a small cavity already existing in the central, where it was secured by a filling. Subsequent experience proved the value of having the bridge detachable, for after the appliance had been worn for some months the pin in the central gave way; the bridge was then quickly removed by unscrewing the nut, a new pin soldered on, and the apparatus replaced.

Dr. Elliott considered that the attachment of an artificial crown by means of a screw and nut was decidedly the best mode of pivoting for these cases, on account of its being easily detachable in case of accident. This was almost impossible when bridge-work was attached to crowns fitted on the Richmond principle. He found also that it was very difficult to prevent food and mucus accumulating under the

overlapping edges of these crowns and leading to bad results. His experience of this method of pivoting dated back some five or six years, the results at first being most discouraging. These failures taught him that in order to obtain satisfactory results he must make his own screws. He found that when he used those sold by the depots the nuts came unscrewed and the crowns came off, frequently in two or three weeks. The screws must be much finer than those usually sold, and the nuts must be conical and cut half through, so as to make them self-locking. He found also that aluminium bronze or German silver were better materials for the screws than platinum, since they became slightly oxidized, and thus held more securely.

Dr. G. Field said he had not used bridge-work very extensively, but he found that in exceptional cases it answered admirably, and he used it under favorable conditions with great satisfaction to himself and to his patients. He had, of course, met with failures, but these had not been sufficient to discourage him, or to induce him to give up the method. He preferred the Richmond crown, or the Webb flat pivot tooth with gold backing, to the use of screws and nuts. In some cases he anchored the ends of the bar into adjoining natural teeth by means of gold fillings. The fillings would break away occasionally, this could not altogether be prevented, but as a rule they lasted very well. In one case where this happened, the patient being unwilling to submit to having another gold filling inserted, he filled with osteo; and although the filling had required attention from time to time to repair the effects of surface disintegration, it had lasted very well. He did not approve, as a rule, of the plan of bridging over four or five teeth, and had only seen one case in which this had been satisfactorily accomplished. The objection on the score of uncleanness was entirely theoretical; the bridge could always be made of such a form as to be easily kept clean.

Dr. A. S. Richmond said the subject under discussion, crown and bridge-work, was one to which he had given

some attention, and which interested him greatly. Dr. W. M. Morison, of St. Louis, the inventor of the Morison chair and engine, was, he believed, the first to make gold crowns encircling the roots of molar and bicuspid teeth; this was in 1868. In 1876, Dr. Cassius M. Richmond, who was then practicing at San Francisco, produced the "Richmond crown." This was a porcelain, or porcelain-faced, crown attached to the natural root by a pin or tube, the attachment being strengthened by a gold band encircling the root. This method was still employed by the best operators throughout the world, and had never been improved upon since.

With regard to bridge-work he would hand round some models of cases which had been under his own care, showing various adaptations of the method. He had a piece of bridge-work in his own mouth which was put in in 1876, and which had therefore stood the test of nine years' wear. In 1878, he had a case in which a loose and decayed lateral adjoined a sound and healthy central. After trying various experiments with the lateral, he extracted it and attached a lateral crown to the central and canine: the work had stood well up to the present time. Early in 1880 he pivoted a first molar with a Morison gold crown and the canine on the same side with a porcelain-faced crown, connecting them by a bridge carrying the two bicuspid; this also was still in use. These cases might serve to show the lasting character of the work. There was no difficulty whatever in keeping it clean, the teeth being supported clear of the gum, and the whole fitted as it should be in a proper workmanlike manner.

Dr. W. Mitchell said he had had a case to deal with that day in which he had been obliged to modify the ordinary Richmond method. He had occasion to remove a Bonwill crown, but found the pin so firmly fixed in the root by amalgam that he found it impossible to remove it. He therefore cut it off even with the gum margin, and then with a fine fissure burr removed the amalgam all round it to the

thickness of about two lines, and to the depth of about a quarter of an inch. He then made the band as usual, soldered on the top, and made a platina tube to fit the pin. He then cut away a portion of the top, placed the band and tube in position, and waxed them together in the mouth. They were then removed in their proper relation for soldering, after which he replaced them and fitted the tooth in the ordinary way. Then, after waxing together and investing in sand and plaster, the soldering was completed and the work was polished and inserted in the mouth, where it fitted perfectly. He thought this plan was really an improvement on the usual method, for the tube added stiffness to the structure, making it much firmer than where the ordinary pin alone was used. Where amalgam was used for setting the pin, of course platina both for pin and tube was indispensable, but he did not see why a good strong cement could not be used with advantage.

Mr. J. S. Turner said that whilst he could not help admiring the ingenuity displayed in these methods of pivoting and bridge-work, he was rather at a loss to know what was gained by all this elaboration. The results might be perfectly satisfactory in a certain number of cases, but it must be remembered that operators did not always know of their own failures. When patients were dissatisfied with what had been done for them by one practitioner, they were apt to go to another. He had lately come across a patient who had had five front teeth pivoted sixteen years ago, viz., two centrals, a lateral, and two canines, and they were still firm and useful. The pivoting was done in the old-fashioned way: the roots were cut down and polished, a pin inserted in the canal, and a model taken, then a tube tooth was fitted, first on the model and then to the root, a little floss silk being wound round the pin before it is forced into the root. The plan of pivoting with nuts and screws might sometimes be useful, but he thought that the insertion of the screw and tightening the nut must be a more unpleasant process than fitting a pin into the canal in the old way. He had seen

many cases when with Mr. Cartwright of teeth which were shed in the ordinary course of nature with pivot-crowns attached which had been in use for a great number of years, and others must have frequently met with similar cases. Seeing then that the results of the old method were generally so satisfactory, he failed to see the advantage of these later and more elaborate methods.

Mr. R. H. Woodhouse said he had lately removed a pivoted tooth which had been in use for twenty-three years; the crown was quite firm, but the root was absorbed. He thought this was a triumph for the old method.

The Chairman said he had personally no experience of bridge-work, and he was disposed to agree with Mr. Turner that there was no great necessity for the use of screws and nuts. He had been in practice a good many years, and he thoroughly agreed with what Mr. Turner had said as to the good results obtained by the old method of pivoting stumps with natural teeth. The pins was made of *hard* gold; a little floss silk was wound round it, it was then moistened with mastic varnish, and forced well up the canal. Teeth pivoted in this way lasted from twelve to thirty years, and the pin never came out—no one ever thought of its doing so. He felt bound to admit, however, that he had not been quite so successful with mineral teeth. He would now call upon Dr. Elliott to reply.

Dr. Elliott said he had himself used the old method of pivoting, but he wished to advance with the times. The weak point of the method described by Mr. Turner was that the front edge of the tooth resting on the front of the stump gave a considerable amount of leverage, and as the result of any strain on the tooth the pivot was sometimes pulled out. Thus a patient of his who had a tooth pivoted in this way lost one crown and bent another. Another objection was that the pin would sometimes stop short in the canal, and use what force you might you could not get the crown close up to the stump.

In his lectures at the National Dental Hospital, he had been in the habit of describing sixty different methods of

pivoting, but he only used two in his own practice, viz., the one he had already described and the Flagg process. This latter method he considered a very good one, and quite as simple as the older method; but though one of the best for front teeth it was not as well adapted to bicuspid as the other. A plain plate tooth was soldered to a pin; this was passed up the nerve canal and packed all about with amalgam. He had brought his drawer of pivoting instruments with him in case any of the members present might like to look over them.

The Chairman thanked Dr. Elliott, in the name of the Society, for his interesting communication, and also Messrs. Hunt, Lloyd Williams, Browne-Mason, Boyd Wallis, and other contributors of specimens and casual communications.

The Society then adjourned.--*The Dental Record*.

ARTICLE III.

STEAM, AND ITS EFFECTS ON RUBBER AND CELLULOID WHEN PROPERLY APPLIED.

BY DR. F. W. SEABURY.

Feeling the general want of something more definite and satisfactory in the manner of manipulating rubber and celluloid, I have experimented, with the following results:

Rubber, exposed in a hot chamber, swells up and becomes porous; compressed in molds and subjected to heat, its density, after curing, is in proportion to the amount of mechanical pressure employed. When vulcanized in a water or steam-bath, pressure is then essential to density, or hardness. The element of toughness is secured by a mild, even temperature. There are several ways to attain

this. The pot vulcanizer was the first. The rubber is placed in an air-tight vessel, immersed in water, and vulcanized from four to twelve hours. The sealed vessel may be immersed in a tray full of water and placed in a steam bath; this is a very mild heat. Chambers nearly surrounded by a water or steam-bath are in common use. These processes answer quite well; but rubber manufacturers have always been experimenting to get dry or super-heated steam, it being a good conductor of heat and a very mild fluid. With the water-bath vulcanizers now in use, it is impossible to distinguish a pure, clean rubber, from one of low-grade stock, loaded with dirt and pigments. When the several red dental rubbers now on the market are vulcanized in the usual way, in a Whitney or pot vulcanizer, they have to be marked before they are put in to vulcanize, in order to distinguish them when taken out. Intelligent experiments cannot be conducted with a Whitney vulcanizer, or with one constructed on the same principle.

The first thing to do, then, is to get a process of vulcanizing which will develop the color. It has been known for years that this could be accomplished by keeping the rubber absolutely dry, by sealing with tin-foil, baking in a hot-air chamber, or curing with super-heated steam. When rubber shrinks, it is either because it has not been properly seasoned, both after washing and after mixing, or it has been packed and vulcanized in a water-bath. The water will separate the rubber from the teeth every time, so that one can get the shrinkage only in a dry oven. Super-heated steam, applied instantly, is the perfect medium for conducting heat to rubber, because it gives the best color and preserves the elasticity of the rubber. Being a rarefied gas, the indicated is always the actual temperature for all parts of the oven, and rubber need never be burned or made granular or porous. That is to say, in order to vulcanize rubber properly, the steam generator must be separate from the vulcanizing chamber, so that the high-pressure steam can come into the chamber instantly, to produce pressure before the heat can be communicated to the rubber.

The term "super-heated steam" is a misnomer to me, and, I think, to others. I will try to explain my idea of it. Intensity of heat is measured by the number of heat units in a given space,—increasing the space diminishes the heat, and decreasing the space increases the temperature, in uniform ratio. When fire is applied to steam, the vapor atoms are expanded, and, of course, occupy a larger space, and if they are not confined their temperature will decrease. A friend of mine, Hon. Ellery Wilson, president of the Rumford Chemical Works, extended a steam-pipe through a large fire-pot, heated white hot, in order to get super-heated steam. He was surprised to feel a draft of cool air coming out of the pipe. After super-heating steam in my vulcanizer, if the test-cock is opened, the steam will feel cool. So, to my mind, "super dry steam" would more nearly express the product. George W. Richardson, the inventor of the pop safety-valve, in order to save the waste from radiation and increase the power of the steam by super-heating, jacketed a locomotive all over, including the cylinder heads, and attached a blower to the flue. The products of combustion in the flue registered 800°F. ; the temperature of the steam was 400° . The hot air lost 300° in passing through the jacket, without increasing the temperature of the steam. The locomotive was run one week, using the blower, and the next week without it; coal and water were measured both weeks, and there were no difference. So, to increase the temperature one must increase the pressure, the heat of steam being dependent on pressure. This is in accordance with the law of mutual repulsion of gases. Vapor lacks capacity for heat. A drop of water will contain 830 times more heat than a corresponding drop of vapor. The steam being dry, the color of the rubber is improved, and is of course uninjured by water or moisture.

To harden dental rubber appears a simple matter enough; but to do it so that it may maintain its best qualities is more difficult than most persons suppose, and a large

proportion of the rubber dentures manufactured are either over-steamed or insufficiently hardened. For this there are several reasons: First, it is found that as the pressure of steam in water increases the conducting power decreases, and the heat tends to accumulate near the point of application. Second, the air in the top of the vulcanizing chamber protects the thermometer from the steam, as air, when still, is a non-conductor. Wildman, by opening a safety valve in the top of the Whitney vulcanizer, thus causing a circulation, increased the indicated pressure thirty-five pounds to the square inch. Rubber manufacturers, when vulcanizing, keep blowing off steam, thereby causing a circulation and equality of heat in all parts of their long ovens. Third, when water comes in contact with rubber, it destroys the color, makes it soft and porous, and also prevents it from adhering to the teeth.

All authorities agree that to get the best results when vulcanizing rubber the temperature of the vulcanizing chamber should be gradually and slowly raised. My process is just the opposite. I commence with dry steam, at high pressure and high temperature, and I claim that rubber cured in this way is tougher, takes a higher polish, and makes a closer union with the teeth; produces a lighter and brighter color, and requires less time to vulcanize and finish.

How Celluloid is made.—A roll of paper is slowly unwound, and at the same time saturated with a mixture of five parts of sulphuric acid and two of nitric, which falls on the paper in a spray. This changes the cellulose of the paper into a fine pyroxyline (gun cotton). The excess of acid having been expelled by pressure, the paper is washed with plenty of water until all traces of acid have been removed; it is then reduced to pulp, and passed on to the bleaching trough. Most of the water having been got rid of by means of a strainer, the pulp is mixed with from twenty to forty per cent. of its weight of camphor, and the mixture thoroughly triturated under millstones. The

necessary coloring-matter having been added in the form of powder, a second mixture and grinding follows. The finely divided pulp is then spread out in thin layers on slabs, separated from one another by sheets of blotting paper, and from twenty to twenty-five of these layers are placed in a hydraulic press, and are subjected to a pressure of 140 atmospheres until all traces of moisture have been got rid of. The plates thus obtained are broken up and soaked for twenty-four hours in alcohol. The matter is then passed between rollers, heated to from 140° to 150° Fahr., whence it issues in the form of elastic sheets. These sheets are then molded into dental blanks, at 260°, and seasoned. Celluloid is in general use, and, as manipulated by manufacturers, the colors stand; it does not warp or crack, and there is no shrinkage. The reason of its failure for dentures is due entirely to the improper method of molding it. Celluloid will adhere to porcelain with sufficient tenacity to pull the enamel off a tooth. Molden on metal dies, and covered with tinfoil, it receives a vitreous surface, which is a non-irritant, and also protects it from the fluids of the mouth. In using single teeth on metal plate, it is necessary to have some substitute for the gum. Celluoid, when properly made, answers the purpose well. Molded in a dry chamber, at 300° Fahr., it will adhere to the gold plate and teeth, making a perfect union, and thus preventing the absorption and retention of the fluids of the mouth and consequent offensive odor. Used as a veneer on gold plate, it is easily repaired.—*New York Odontological Society Proceedings.*

ARTICLE IV.

DENTISTRY IN FOREIGN COUNTRIES.

BY DR. CHARLES A. KINGSBURY, PHILADELPHIA, PA.

Some of my own impressions and experiences, while travelling through Europe and the East, some years ago, may be of interest. My visits to the native dentists, and the acquaintance I formed with them, though necessarily limited, convinced me at that time that they were, in many respects pertaining to their profession, considerably below the standard of the reputable and experienced dentists of our own country. I will mention a case in point that occurred during my visit to Beyrut, Syria. Beyrut contains a population of some six thousand, a large proportion being English, French and German. Soon after my arrival there, I was called on by a Turkish gentleman connected with the American Mission and College, who wished to consult with me in regard to his teeth. I found that he was wearing a full artificial denture of rubber, and that it caused him great trouble and suffering. It was obvious that the defects were so radical as to require an entire reconstruction of the dentures both upper and under. Upon stating this fact to him, he desired me to take the dentures for him. I replied that I was travelling, not professionally, but for my health and pleasure; that I had no dental instruments with me, and that it would be impossible for me to serve him in that way; but if he would bring his dentist to see me, I would consult with him, making such suggestions and rendering such assistance as would enable him to make great improvements on the set he had. The next day he called on me, in company with his dentist, whom I found to be an Austrian,

from Vienna—a gentleman of culture, with a medical education, but quite deficient, in some respects, as a practical dentist. He was very cordial, seemed glad to see me (having seen my name in connection with the Philadelphia Dental College) and was gratified for the advice and aid I gave him.

I made an appointment to meet the patient at his office, where I took the impression, and so directed the construction of new dentures that before I left the city the patient was in possession of dentures that he found to be a great improvement on the former. He seemed delighted, and subsequently called at my hotel to express his gratitude, and to prevail on me, if possible, to remain and practice my profession in Beyrut, engaging if I would do so, that I should have all the business I could desire. I was obliged to decline his urgent invitation, thanking him for his appreciation of American dentistry, stating that I had a practice and professional interest in my own country that I could not be persuaded to leave. In Zurich, Switzerland, I found that a young American dentist, Dr. Senel, was building a most successful and lucrative practice. I found another American dentist at Florence, Italy. At Rome I called on Dr. Buridge, an American dentist, who enjoyed the reputation of being a fine operator, and was patronized by the Roman nobility and foreign residents.

For many years Dr. Brewster was the representative of our profession in Paris, and was *immediately* successful. It is probably known to most of you that it was with him that Dr. T. W. Evans became associated in practice, on his going to Paris some years ago, and no doubt to this fact, in part, as well as to his professional skill and personal merit, Dr. Evans is indebted for his unprecedented success. Probably no professional man, surgeon, physician or dentist, ever received the patronage of so many crowned heads, princes, nobles and persons of distinction and great wealth, as the American dentist, Dr. Thos. W. Evans, of Paris. His fees have been fabulous, and the emoluments of his

practice have been so large, that his present wealth is estimated by millions. During my visit to Paris, in 1867. Dr. Evans was very cordial, and extended to me many acts of professional courtesy and personal kindness, which I fully appreciated, and to which I take pleasure in bearing my grateful testimony at this time. Dr. Gage was another American dentist, at that time enjoying an enviable reputation and success in Paris. In consequence of bad health, he was obliged to give up his practice, which was worth some \$20,000 a year. Dr. Duboucet, of our city, negotiated for his practice, and became his successor, retaining most of his patients. Europeans seem to possess stronger local attachments than our restless, migrating American people. The dentist who buys out the good-will and practice of a European dentist, will be very likely, in case he is competent and can be strongly recommended, to retain nearly all the patients of his predecessors. Patients do not become scattered as they do in American cities.

The time may have gone by when American dentists can find such openings for practice as were found by Brewster, Evans, Gage and some others. But thirteen years ago there were great inducements offered to American dentists to open offices for practice in various cities of Europe. And I have no doubt of their being many most desirable opportunities for them now, not only on the Continent, but even in England, inasmuch as students from all nationalities come to the dental colleges of the United States of America for their education. I think the presumption is fair, that it remains for the American dentistry to supply the needs of the world, as it regards dental practice, to a large extent.—*Trans. Odontological Society.*

ARTICLE V.

A CASE IN PRACTICE.

(Death of the Pulp in a Perfectly Sound Tooth from an Unknown Cause.)

BY H. H. EDWARDS, D. D. S., MADRID, SPAIN.

Description and habits of patient:—

Age, 29 years; married; of a nervo-bilious temperament; very regular habits; a smoker; takes a fair amount of fresh air daily; health in general, good, though not of robust constitution; slight build; brown hair; blue eyes; twenty-seven sound teeth standing, one tooth the pulp of which—the trouble in question—is dead; the two upper first molars and the right lower first molar were extracted when a youth; the third left lower molar not yet erupted. He had regular good health until five years ago, when rheumatism intervened, resulting in fever. During the last five years has lived in England, United States of America, France and Spain, in which latter country he now is, having been located there for two years. Teeth, strong, dense and upper incisors naturally separated. Profession, dentist.

History of the tooth in question:—

The left upper lateral incisor. Originally it articulated inside the left lower cuspid; at 12 years of age it was brought outside, and into its proper line. It was always a little longer than the central incisors and lay in position slightly oblique from the median line. Until date the patient never had any suffering whatever in said tooth. Towards the tenth day of intense pain it became slightly loose and elongated.

Circumstances attending the first paroxysms:—

About six weeks ago, while at breakfast, he happened to place the tip of the tongue against the lingual portion of the festoon of the gum, and experienced such an intense

—as it appeared to him—excruciating nerve-pain, that, until examination proved to the contrary, he believed it must have arisen from an exposed pulp beneath the margin of the gum. Such was the character of the pain.

The appearance and condition of the gum:—

Both lingually and labially the gum appeared perfectly normal. Throughout the duration of pain the labial surface never presented hyper-sensibility, while, on the contrary, lingually it was acutely sensitive, though unattended by any redness or swelling.

Progress and duration of pain:—

The progress was an upward one, gradually augmenting until the patient was driven by it to undergo the operation.

The duration of the pain was twelve days, only ended by the operation.

During the first few days the tooth ached when the tip of the tongue or any food in mastication was brought in contact with the lingual surface of the gum, or by the contact of anything hot with the tooth itself. Pressure did not affect it. About the sixth or seventh days a peculiar “welling up” pain recurred at intervals, as if the nerves of the pulp exhausted themselves, and after a rest of a half hour or so regained fresh energy or sensitiveness; these attacks were absent during the night. On the tenth, and especially the eleventh days, these paroxysms became more frequent and so intense as to become unbearable; they would commence with a slightly itching pain and within a minute would assume such a full, bursting pain as though the tooth must split unless some relief offered. The pain confined itself to the left side, never passing the median line, and embraced every tooth, especially the one in contact—the left lower cuspid—and extended to the left temple.

Remedies applied:—

As it is proverbial that shoemakers wear the worst shoes, etc., etc., so dentists as a rule, when in full practice, in the same ratio neglect their own teeth. Simply through want of time, and looking forward to the vacation when

their teeth can be thoroughly attended to, they are apt to put off the evil day. In this case it was so, and the only remedy he tried that had the slightest effect in calming the agony was cold water, which, the moment it was brought in contact with the offending tooth, caused the pain gradually to decline and for a period to entirely disappear. Direct upward pressure would to a degree alleviate the pain, but lateral pressure aggravated it.

Ultimate results:—

On the twelfth day he noticed that the tooth had turned a purple-grey color, so then sought professional aid and had the pulp-chamber drilled into and opened up from the lingual face. The pulp was found congested, and was exceedingly painful during the operation of cleaning the canal. Chloride of zinc was injected, and so it remained for two days, when the root was filled with cedar-wood, dipped in plastic oxy-chloride of zinc—which root-filling, by the way, I have tested, and have several on a two-year record doing well—then when the soreness had passed off, the coronal cavity was plugged with gold.

Prognosis:—

At the present moment the tooth is firm and has not given the slightest trouble, being nearly a month since the operation. I thoroughly believe, though perhaps contrary to the theory of Dr. Sexton, that it will subserve its purpose and do good work for many years to come. Of course its fate will eventually be the fate of all so-called "dead" teeth, but I think we should be rejoiced to know that we have saved one more tooth from the immediate fatal clutch of the forcep.

What caused the death of the pulp?

1. Dental caries? No.
2. A blow? No.
3. Excessive heat or cold in contact with tooth? No.
4. Cracks in the enamel? No.
5. Pulp nodules? No.
6. Reflex irritability from functional derangement of

the stomach? No.

7. Atmospheric changes? Possibly.
8. The effects of rheumatism? Probably.
9. Reflex irritability from non-erupting lower third molar? Possibly.
10. The effect of having been regulated? Query.
11. Peridental irritation? I think not.

The foregoing diagnosis reduces the lesion to five possible causes.

Observations and enquiry:—

The case was certainly one of acute pulpitis, which by neglecting remedial means ran on to chronic pulpitis, and, no doubt, by the frequent use of cold water—not making it “persistent”—hastened on congestion. The pain was first felt around the lingual portion of the gum, thereby suggesting peridental trouble through mechanical or chemical injury. Upon examination for any cause, as, for instance, a fish-bone or bristle from tooth brush, etc., made almost immediately, no trace of such was found. I have in my own mind dismissed periodontitis as being the cause, because the pain, in the first place was only felt on the one side, and there was perfect exemption from pain—upon pressure—upon the other. Also, I doubt if acute periodontitis could exist for ten days without a loosening or elongation of the tooth taking place. That the pulpitis produced periodontitis I have no doubt whatever, because, on the last three days the tooth actually was loose and elongated, which state continued during the two days after the root was filled.

The influence of atmospheric changes—and I may couple with that the fact of having caught cold in the tooth—may, I think, be also dismissed, on the ground that, although the winter here has been exceptionally severe, with great variations in thermometer and barometer, still, the worst changes were past at the time of the trouble. On account of the sudden and persevering character of the attack, I rather attribute it to some local or systemic cause.

Let us see how the "Reflex irritability from a non-erupting lower third molar" fits. The molar is on the same side of the median line, at least, I believe it is, for there being no indication of its presence, I conclude it ought to be—and no inconvenience whatever has been experienced. Again, by the sudden and persevering character of the attack, I can understand a non-erupting tooth causing trouble either to its fellow tooth or teeth; in its effort to erupt, or even to produce a chronic state of things elsewhere; but if the lesion was brought about by a state of chronicity, I take it that pain, or at least uneasiness, would have given some warning weeks or perhaps months beforehand.

Well, let us try and fix rheumatism as the cause producing the lesion. Dr. Garretson says in his *Oral Surgery*, page 361, paragraph 1, "In a constitutional direction, rheumatism is, perhaps, the most frequent source." He is speaking of teeth, perfect or seemingly so, but he does not state how such a state of things is brought about, neither does he give the characteristic symptoms arising from such a cause. Of course one can understand the effect of rheumatism, as in this case, covering a period of four or five years, depressing the nervous system at large, and no doubt weakening the heart's action; but why, I must repeat, the sudden and perserving character of the attack, after so long a period? Why that particular tooth and no other? It is the pathological tooth, I admit, but chronicity, on this supposition, would surely be established, and a warning given before death of the pulp could take place.

Lastly, I would ask my professional brethren, through the indulgent means of the *Dental Practitioner*, whether they have on record any teeth that have been regulated—not after twelve years of age—giving trouble through the mechanical interference with nature's work? Or is it possible, in the course of being pushed out at a sharpish angle, so to twist the apical portion of such a tooth that the passage for the nerves and blood-vessels of the pulp has become

constricted, thereby creating a state of affairs mischievous enough at any moment to strangle the vessels and so cause a rapid death of the pulp? In this case the exploring probe showed the apical portion of the root to be so bent. I may add that two experienced members of the profession have examined the tooth but have not been able to diagnose the cause, though they have treated similar teeth in their practices. Two of such instances I have lately seen, being the two lower central incisors in the same mouth.

What I want to know is, with all the above history at hand from which to deduct facts, what should cause the pulp of an apparently unblemished tooth to take on active inflammation and to die after a good record, say twenty years.—*The Dental Practitioner*.

AMERICAN DENTAL ASSOCIATION.

The twenty-fifth annual meeting of the American Dental Association will be held at Minneapolis commencing August 4th. 1885.

The present prospects are that the meeting will be an unusually large one.

The railroad rates have been secured at an unprecedentedly low rate. Tickets for the round trip from New York to Minneapolis and return will be furnished for \$24.00. Round trip from New York to Chicago and return \$18.00. Round trip from Chicago to Minneapolis and return \$6.00.

At present it will be necessary for those wishing these tickets to secure them in Chicago. Later we may be able to make arrangements by which they can be secured at different points east. By sending check for tickets to chairman of committee of arrangements the tickets will be promptly forwarded.

Negotiations are pending for rates from other points that the committee anticipate will accommodate all, and

more definite information will be given in later journals and also in a circular sent to every member.

The hotel rates are as follows:

West Hotel,	-	-	\$4.00 per day.
Nicollet House,	-		\$3.00 " "
National Hotel,	-	-	\$2.00 " "

It is expected that a reduction from these will made. It is hoped that members having any new facts or ideas in regard to theory or practice will come prepared to present them in connection with the section work. Any one having anything new in the way of appliances will be given an opportunity to demonstrate their use during the half day that will be devoted to clinics.

ATTRACTIONS AND EXCURSIONS.

Come equipped with guns and fishing tackle. While the interest and benefit of the meetings, the attractions of the trip and the beautiful city where we meet are too well known to need special mention it may not occur to all that they will find themselves in Minnesota in one of the finest of hunting and fishing countries. Minnesota is especially famous for its prairie chicken and grouse shooting, and its fine fishing grounds.

It is estimated that there are no less than 10,000 lakes dotting the state.

If one wishes a still greater variety of scenery, to see a new wild and picturesque country, to draw out the big brook trout, the black bass, the "gamy" pickerel and the mighty muskallonge from the cold waters of the Lake Superior region, in fact to enjoy the finest fresh water fishing in the world, a round trip ticket from Chicago to Ashland and return will be furnished them for \$10.00.

A STILL GREATER ATTRACTION.

(If one more were needed) is offered in shape of a ten day's excursion to the far famed "Yellow Stone National Park," immediately upon close of the association, provided a sufficient number send in their names to warrant the

securing of special cars and special rates. The committee believe that when so far on the way as Minneapolis many will wish to avail themselves of this opportunity of seeing the grandest scenery in the world. The entire expense for round trip from Minneapolis including rail transportation, Pullman Sleeping Car Fares, meals on Northern Pacific Dining Cars, hotel accommodations, five days in the Park and stage transportation, will be \$120.00. A circular describing the magnificent scenery in full will be sent to every member of the American Dental Association at an early day. Others than members who may contemplate going will receive the same by making application for it.

Come one, come all and bring your wives along. It will be a trip that ladies will especially enjoy. Those wishing to go to Yellow Stone Park will please send in their names at an early day that all arrangements may be speedily and satisfactorily completed.

For further information address J. N. Crouse, 2101 Michigan Avenue. Chairman of Committee of Arrangements.

EDITORIAL, ETC.

CALIFORNIA STATE DENTAL LAW.—An Act to insure the better education of practitioners of dental surgery, and to regulate the practice of dentistry in the State of California, approved March 12, 1885.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. It shall be unlawful for any person who is not at the time of the passage of this Act engaged in the practice of dentistry in this State to commence such practice, unless he or she shall have obtained a certificate as hereinafter provided.

SEC. 2. A Board of Examiners, to consist of seven practicing dentists, is hereby created, whose duty it shall be to carry out the purposes and enforce the provisions of this Act. The members of said Board shall be appointed by the Governor from the dental profession of the State at large. The term for which the members of said Board shall hold their offices shall be four years, except that two of the members of the Board first to be appointed under this Act, shall hold their office for the term of one year, two for the term of two years, two for the term of three years, and one for the term of four years, respectively, and until their successors shall be duly appointed and qualified. In case of a vacancy occurring in said Board, such vacancy shall be filled by the Governor in conformity with this section.

SEC. 3. Said Board shall choose one of its members President, and one the Secretary thereof, and it shall meet at least once in each year, and as much oftener and at such times and places as it may deem necessary. A majority of said Board shall, at all times, constitute a quorum, and the proceedings thereof shall, at all reasonable times, be open to public inspection.

SEC. 4. Within six months from the time that this Act takes affect, it shall be the duty of every person who is now engaged in the practice of dentistry in this State to cause his or her name and residence or place of business to be registered with said Board of Examiners, who shall keep a book for that purpose. The statement of every such person shall be verified under oath before a Notary Public or Justice of the Peace in such a manner as may be prescribed by the Board of Examiners. Every person who shall so register with said Board as a practitioner of dentistry shall receive a certificate to that effect, and may continue to practice as such without incurring any of the liabilities or penalties provided in this Act, and shall pay to the Board of Examiners for such registration a fee of one dollar. It shall be the duty of the Board of Examiners to forward to the County Clerk of each county in the State, a certified list of the names of all persons residing in his county who have registered in accordance with the provisions of this Act, and it shall be the duty of all County Clerks to register such names in a book, to be kept for that purpose.

SEC. 5. Any and all persons, who shall so desire, may appear before said Board at any of its regular meetings and be examined with reference to their knowledge and skill in dental surgery, and if the examination of any such person or persons shall prove satisfactory to said Board, the Board of Examiners shall issue to such persons as they shall find to possess the requisite qualifications a certificate to that effect, in accordance with the provisions of this Act. Said Board shall also indorse as satisfactory diplomas from any reputable dental college, when satisfied of the character of such institution, upon the holder furnishing evidence satisfactory to the Board of his or her right to the same, and shall issue certificates to that effect within ten days thereafter. All certificates issued by said Board shall be signed by its officers, and such certificates shall be prima facie evidence of the right of the holder to practice dentistry in the State of California.

SEC. 6. Any person who shall violate any of the provisions of this Act, shall be deemed guilty of a misdemeanor, and, upon conviction, may be fined not less than fifty dollars nor more than two hundred dollars, or confined six months

in the county jail for each and every offense. All fines recovered under this Act shall be paid into the Common School Fund of the county in which such conviction takes place.

SEC. 7. In order to provide the means for carrying out and maintaining the provisions of this Act, the said Board of Examiners shall charge each person applying to or appearing before them for examination for a certificate of qualifications, a fee of ten dollars, which fee shall in no case be returned, and out of the funds coming into the possession of the Board from the fees so charged, and penalties received under the provisions of this Act, all legitimate and necessary expenses incurred in attending the meetings of said Board shall be paid. And no part of the expenses of the Board shall ever be paid out of the State Treasury. All moneys received in excess of expense, above provided for, shall be held by the Secretary of said Board as a special fund for meeting the expenses of said Board, and carrying out the provisions of this Act, he giving such bonds as the Board shall from time to time direct. And said Board shall make an annual report of its proceedings to the Governor, by the first of December of each year, together with an account of all moneys received and disbursed by them pursuant to this Act.

SEC. 8. Any person who shall receive a certificate from said Board to practice dentistry, shall cause his or her certificate to be registered with the County Clerk of the county in which such person may reside, and the County Clerk shall charge for registering such certificate a fee of one dollar. Any failure, neglect, or refusal on the part of any person holding such certificate to register the same with the County Clerk as above directed, for a period of six months, shall work a forfeiture of the certificate, and no certificate, when once forfeited shall be restored, except upon the payment to the said Board of Examiners of the sum of twenty-five dollars, as a penalty for such neglect, failure, or refusal.

SEC. 9. Any person who shall knowingly and falsely claim or pretend to have or hold a certificate of license, diploma, or degree, granted by any society organized under and pursuant to the provisions of this Act, or who shall falsely and with intent to deceive the public, claim or pretend to be a graduate

from any incorporated dental college, shall be deemed guilty of a misdemeanor, and shall be liable to the same penalty as provided in section six.

SEC. 10. Nothing in this Act shall be so construed as to prohibit any practicing physician from extracting teeth.

SEC. 11. This Act shall take effect immediately.

The members of the Board appointed by the Governor as follows:

S. W. Dennis, M. D., D. D. S.,	<i>President,</i>	-	San Francisco.
E. W. Biddle,	-	-	Healdsburg.
J. W. Hollingsworth,	-	-	Los Angeles.
Thos. Morffew, D. D. S.,	-	-	San Francisco.
S. S. Southworth,	-	-	Sacramento.
M. J. Sullivan, D. D. S.,	-	-	San Francisco.
Chas. W. Hilbard, D. D. S.,	<i>Secretary,</i>	-	San Francisco.

Respectfully,

C. W. Hilbard, *Secretary.*

A CIRCULAR.—The periodical literature of the dental profession of this country has grown to such proportions as to call for joint action on the part of those more prominently connected with the direction of its affairs.

Union and co-operation give quality and strength to any enterprise beyond what can be attained by individual effort. With this fact in mind it is suggested that a meeting of the editors in chief of the dental journals published in this country, or their representatives, especially of the monthlies whose subscription price is not less than two dollars a year, and of the quarterlies whose subscription price is not less than one dollar a year, be held at Minneapolis at the time of the meeting of the American Dental Association in August next, for the purpose of considering propriety and feasibility of organizing in some form with a view of promoting the interests of American dental journalism.

If this call meets with sufficient encouragement a time and place of meeting will be fixed and due notice given to all who may respond to this circular.

J. TAFT.

C. W. SPALDING.

F. J. S. GORGAS.

MONTHLY SUMMARY.

REGULATING TEETH.—Regulating teeth is a delicate and skilful operation. Perhaps there are fewer dentists successful in this than in any other important dental manipulation. Few comprehend the principles that should govern the process, and still fewer are able to carry them out when theoretically understood. There is no doubt, much depends on thoroughly studying the individual case, and this can hardly be mastered without a good model and articulation of the entire mouth. Trouble attempted to be saved here is troubled during the entire operation. First know well your case—the relative position of the teeth—the good old standbys to serve as standards of measurement and fulcrums of force—the general direction of strain to bring about the desired arch, and the special movement of individual teeth to accomplish this—the obstructions to proper occlusion, and how to overcome them, and how, finally, normal articulation shall preserve the advantages gained. Then again, it is not only the moving of teeth we are to consider, but so placing them that they will maintain one another in their new places. It is not only their proper harmony of position we are to look for, but their proper length with reference to each other and such a champing of the back teeth and adjustment of the front teeth that they will be, as it were, dovetailed into position by their very occlusion, and advantageously do their master's service. This may mean as much the grinding of a cusp or shortening of a whole tooth as change of position.

To accomplish all this nothing can take the place of native skill and ingenuity, and, perhaps not less, the development of good common sense. These must be developed to determine the proper appliances and manipulations, and to comprehend the case from its incipency to its completeness,

every act, and every apparatus brought into use must be guided by good judgment.

Yet, however ingenious we may think ourselves, it will not do to rely only on our own resources. The struggles, perplexities and dire extremities of others, which have developed skill and perfected unique appliances and thus taught principles and brought final success, should be studied with the greatest care. Our standard works can be consulted with profit and our current literature abounds with instructions. Some in our profession have been so eminently successful that their mode of procedure has been sought by others not so fortunate. This has resulted in descriptions in our monthly journals that are, perhaps, superior to the instructions of our books. Dr. Coffin's method will well repay careful study; so will the Patrick process. To give details here would make our article too long. The experiences of many others given in our journals are worth the most diligent perusal.

When once the principles involved, and the appliances to be used, are well mastered, the road to success is not so difficult. In Washington, the other day, I was shown in the laboratory of a leading dentist the models of a young lady's mouth, so peaked and contracted, speech must have been difficult and unnatural, and so unsightly that the features must have been repulsive. I was then taken into the reception room and introduced to the young lady. Though the work was not complete, the change was marvelous. "Do you know yourself?" said I. "Some of my friends say they do not know me, I look so differently. I begin to think I am pretty good looking, now," she replied. And this was a fact, her features had assumed a symmetry and harmony of expression that was charming; and her voice had changed from a squeaking key to a sweet tone that was musical. The Patrick method had chiefly been used in this case.

It is still a question whether the constant force of elastic springs and rubber bands, or the successive steps produced by screws, etc, are better; whether the "heroic method" of quickly changing the position of teeth, or the slower course requiring months to accomplish the final change, is more desirable: whether the added room sought to bring teeth into

proper position should be partly by extraction, or wholly by the expansion of the alviolus arch.

But it was not our design at this time to combat or to champion any special plan, but if possible to draw attention: First, to the neglect of this branch of our calling; second, to its importance; third, to the necessity of thorough study to be able to act wisely in managing cases, and fourth, to show that if the principles involved are well understood and the appliances prepared are judiciously employed, the work of regulating teeth is not difficult.—*Items of Interest.*

FILLING MATERIALS.—*To the Editor of the "Journal of the British Dental Association":*—SIR,—Your correspondent, "Experientia Docet," has evidently no idea of the difficulty of what he proposes. To get a correct analysis of all the amalgams in the market would cost a very considerable sum; for any private person to make the assays would be useless, or worse than useless, as the results would be disputed by every maker. Very few samples of amalgams in the market can be depended on to come out twice alike, and only those who are in the habit of assaying can form an idea of the practical difficulty of making two ingots, or even two parts of the same ingot, alike in composition. Supposing this work to be done, we have again to contend with the different ways operators will use the same material, and the practical result is that a filling which is good in the hands of one operator may be worthless in the hands of another.

With regard to the "whole class of plastic fillings, other than amalgams," the difficulty is still greater. There are many white fillings in the market which are quite beyond the reach of either the chemist or the microscope, and in the absence of some special information, it is simply impossible to tell how they are made. In preparations of oxide of zinc alone, each maker has his own process, which he must either keep to himself or give up the idea of being repaid for his labors, for he would have a host of imitators at once; perhaps no one has suffered so much as myself on this point. The powder of almost all white filling in use at present is a more or less pure oxide of

zinc, and yet its preparation in the densest form capable of being taken up quickly in combination, is a matter kept secret by all makers. Some fuse it into a mass with a trace of borax or glass, and grind the result, others prepare it by heating certain zinc salts to exact temperatures, others by selecting the heavier oxide from the flues of the subliming chambers, others by pressure; but, given the chemical composition, an outsider would find it almost impossible to produce an exact copy of any given preparation unless he had the details of the process explained to him in the most minute way. Secret processes are to my self an abomination, they class with patent medicines, quack doctors, and other similar evils, but there is really no help for them, they must exist, or there are plenty of unprincipled rogues ready to cheat the original investigator out of the result which has perhaps cost him years of labor and a little fortune to arrive at. I have worked amongst white fillings long enough to be able to tell almost in every case without hesitation the process used in their manufacture, but it might take three months hard work to produce an exact copy of any one, and until this exact copy is produced. The same remarks as to the difference manipulation of different users apply to these fillings as well as to amalgams, and the whole subject is so beset with difficulties, that it is no tlikely any committee will ever have the time, the money, and the patience to wade through it. I have given up years of steady systematic work to experimenting on plastic fillings, in fact, the greater part of the apparatus in my laboratory list was designed specially for this work. and two conclusion arrived at in my own mind is that very little is known on the subject, and failing some purely accidental discover, the working out of any great improvement will be the work of a life-time.

I am sir, yours etc.,

WARRINGTON, Jan., 1885.

THOMAS FLETCHER.

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ARTICLE I.

SOUTHERN DENTAL ASSOCIATION.

SEVENTEENTH ANNUAL SESSION.

Reported by Mrs. M. W. J. for Southern Dental Journal.

The Southern Dental Association convened in the city of New Orleans, La., on Tuesday morning, the 31st of March, 1885, at Tulane Hall.

The membership of the association was well represented from nearly all of the Southern, Eastern, Northern and Western States, among whom may be named Drs. McKellops, Spalding and Morrison, of St. Louis; Cushing and Harlan, of Chicago; H. A. Smith and J. Taft, of Cincinnati; Bonwill, of Philadelphia; Patrick, of Illinois; Parmley Brown, of New York, and many others; also members of the National Association of Dental Examiners and representatives from the State Boards of Indiana, Illinois, Michigan, Ohio, Georgia, Maryland, Mississippi and Louisiana.

The Association was called to order at 10 A. M., President Rawls in the chair.

The following address of welcome was delivered by Dr. L. A. Thurber, of New Orleans:

Mr. President and Gentlemen:

By the request of the Committee of Arrangement, I have the distinguished honor of welcoming you to New Orleans; to the same hall where, fifteen years ago, was held a meeting of the Southern Dental Association, of the most gratifying character. Year after year we have seen this body steadily working to advance the destinies of a profession which honors every one of its members. To crown its efforts in the path of progress, this session is held in this Crescent City, chosen at this time by the civilized world as the grand exchange and point of display of all that can improve and benefit the condition of man. As dentists, as men proud of our calling, we have a right to a place in this congress of human ingenuity; it is appropriate that we should meet here and show the world the accomplishments of our art, founded on the highest principles governing science, and made famous by American brains and American hands. Ignored by the learned professions less than forty years ago, we to day stand on a footing of equality with any craft whose mission is the alleviation of human suffering. And more than this, we are a recognized, independent, liberal profession. Our meetings are always fruitful of rich results. The more advanced tender freely the knowledge they possess, the experience they have gained, to the more humble or less privileged, with a generosity and kindness characteristic of members of one family. To a gathering of such loyal men, I am here to say WELCOME! Welcome, with the hope that the deliberations held here will add one more stone to that monument which you are erecting to your profession, and which is consigned to immortality.

And now, my friends, you who have assigned to me this honorable task, if I have not welcomed your visitors in language more eloquent, and thought of greater depth, I indulge the hope that you will forgive my shortcomings, and only remember the sincerity of my purpose.

Dr. W. H. Morgan, of Nashville, responded on the part of the Association.

The President delivered his annual address, which included an able paper on Pyorrhœa Alveolaris, published elsewhere. Discussion of this paper was deferred until the subjects of Pathology and Therapeutics should be reached, in the regular order of business.

Report of Executive Committee called for.

Dr. Walker, chairman, announced the following programme for sessions, subject to the will of the Association.

Tuesday, March 31st, three sessions—10 A. M., 1 P. M., and 7 P. M.

Wednesday, April 1st, the same.

Thursday, April 2d, Dentist's Day at the World's Centennial Exposition; programme to be issued later.

Friday, April 3d, Clinics, all day, in Tulane Hall.

Saturday, April 4th, three sessions, as on the first two days.

After various suggestions on the part of Drs. Catching, Taft, Wright, Thurber, and others, it was decided to adjourn from one session to the next, guided by developments; the programme for Thursday and Friday being accepted as announced.

The President stated that the committee on applications for membership was in session, ready to give all needed information as to conditions, dues, etc.

Also, that by the law of the Association, all dues must be paid before the privilege of the floor was allowed.

On motion of Dr. Chisholm, visiting members of the profession, and all physicians, were invited to participate in the discussions.

The hour for adjournment having arrived, the Association adjourned, to meet at 2 P. M.

FIRST DAY, EVENING SESSION.

The Association met according to adjournment, President Rawls in the chair.

Dr. J. R. Walker, being the only member of the Executive Committee in attendance, Drs. Wardlaw, of Augusta, and Chisholm, of Tinsalbos, were appointed by the chair to fill the vacancies.

Report of Committee on Dental Education called for. Dr. W. H. Morgan, chairman, not being prepared, no papers offered; subject passed.

Drs. O. Salomon and E. J. DeHart presented their credentials as delegates to the Association from the Louisiana State Society, which were received, and their names presented to the Committee on Membership.

The committee reported as having been passed upon favorably the names of Drs. B. L. Byrnes, Memphis, Tenn.; J. D. Miles, Vicksburg, Miss.; J. B. Askew, Vicksburg, Miss.; R. J. Miller, Jackson, Miss.; O. Salomon and E. J. De Hart, New Orleans. On vote by ballot, they were declared unanimously elected, and their names ordered entered on the role of members of the Southern Dental Association.

Report of the Committee on Hygiene called for.

Dr. W. C. Wardlaw, chairman of the committee, read a paper, which will be found elsewhere in this issue.

Dr. Wardlaw then read a paper from Dr. B. F. Arrington, on the same topic.

Dr. Arrington took the ground that we needed common sense, practical suggestions, rather than theories; that the field was not so broad as generally supposed. When we went beyond the treatment of the teeth and diseases of the tissues of the mouth, we were at sea, in deep waters,—beyond our depth, beyond our specialty. It is our business to preserve the teeth and gums in condition for comfort and usefulness. This is the limit of the dental practice. If this is well done, patients will be satisfied. Consider treating and dieting with a view to future generations absurd and impracticable. Accept the situation, and our duty is plain. The teeth, from the age of nine or ten, should be examined frequently. The treatment of young teeth should be temporizing, not attempting to do too much; examining

frequently, and never waiting until decay is too far advanced. The age of patient, locality and structure of tooth must decide the material to be used. The removal of tartar will be appreciated. Use sulphuric acid for pyorrhœa alveolaris, which it is well to call by its common name, scurvy. Let the treatment be mild or heroic, as indicated; would treat for months, if necessary, by local applications. Consider prescribing mountain air, sea air, etc., as absurd, and involving useless expense, as far as benefit to the teeth went. (Submitted sample of proper size, shape and quality of tooth brush,)

These papers elicited a lengthy and spirited discussion.

Dr. Catching said there were ideas in both papers that should be impressed both on the profession and on the people. Should condemn all secret preparations, no matter by whom compounded, unless the formula was furnished. The Tablets of Dr. J. L. Lyon are *probably* a good thing. They have been on the market a long time, but we have no right to prescribe them so long as we do not know the ingredients. We want friction to cleanse the teeth, but we get no friction with soap; therefore, it is useless. Would never recommend a wooden toothpick.

Dr. J. R. Walker said he objects to recommendation of *moderately* stiff tooth-brushes. If 100 represents the range of tooth-brushes, would never use more than 25. A stiff brush tears the gums, and fails to enter the spaces between the teeth. The stiff brush is a prominent factor in the causation of pyorrhœa alveolaris. Would use a soft brush, and soap, too, after oily food, and brush from the gum to the cutting edge. Wooden toothpicks are an abomination and a snare.

Dr. C. W. Spalding: The subject of Dental Hygiene is an exceedingly important one. The teeth of children are too often neglected; sufficient attention is not paid to their cleanliness. The general impression among the people is that, as they are soon to be replaced by others, they are of very little importance.

Had labored sternuously to correct these false ideas, but the means of reaching the masses are limited. There is a variety of opinion as to modes of cleansing. The gums require friction as well as the teeth. A stiff brush of good quality can be rendered flexible, but a common stiff brush will never be a good one. The manufacture of tooth brushes needs remodeling, as well as the habits of the people. The motion in brushing should begin on the gums, and move towards the ends of the teeth. A stiff brush used across the teeth often does harm, but if used in the way I have indicated, no injury will be done. If the brush handle is straight, a rotary motion on the axis of the handle is an effective one. No dentist is warranted in prescribing secret preparations of any kind. He is entitled in advance to know the formula.

A dentifrice is chiefly useful in increasing the friction of the brush; soaps are lubricants, and diminish friction. Tooth-washes are as valueless as water. Therapeutically, uses local applications only for specific purposes, such as pyorrhœa alveolaris and the devitalization of pulps.

True hygiene must commence in early life. If proper habits are formed in childhood, there will be little trouble in after life.

Dr. W. H. Morgan: Both papers good as to general principles. Have failed to secure all the benefits that Dr. Arrington claims from sulphuric acid. "Clean teeth will never decay?" Do not know what that means. Decay, in many instances, does not result from foreign substances, as in case of vitiated fluids. If the acid theory be true, the mouth may be very clean, and decay be rapid. Must reach further back for causes. It was said that "mothers must have pleasant surroundings to secure good teeth for progeny." In the hills of Tennessee, the mouths of children, amidst surroundings of filth and squalor and absolute want, present a most favorable contrast to the teeth of children in New Orleans. Keep the mother in general good health, but no special condiments are required; nothing in that

theory. Had swallowed it when first advanced, but had reached a contrary opinion.

There is no article of diet but what has in it more limesalts than necessary to develop the osseous system. But very small weight of lime-salts in a dry skeleton—Huxley says not more than two pounds. In rice, which is the poorest material used, there are nine-tenths of one per cent. If three pounds are eaten in a year, and it takes seven years to wear out and rebuild the skeleton, there will be one pound of bone material furnished from this poorest of all materials. It has been claimed that the Mississippi Delta has no lime-salts! Look at this great river. It takes up the lime-salts from the clay it passes through, from the limestone beds of the Tennessee, from Ohio and New York, by the Wabash from Illinois, by the Red River from Arkansas, lime is brought and spread all over this country, forming this alluvial soil. The cereals are intended to meet our wants. Dentifrices and washes scour and correct acids. The result of my investigations is that the most rapid decay is when the fluids are decidedly alkaline. Do not say that alkali dissolves tooth substance, but that some chemical action takes place that favors decay. Am most concerned in case of alkaline saliva. Ammonia, when exposed to atmospheric action, develops nitric acid; this is neutralized in its nascent state, and is found by tests—not in the saliva, but in the tooth-bone. We need something to neutralize alkaline fluids. As regards stiff brushes, they were formerly universally recommended, to the terrible destruction of teeth. If the brush is too stiff, the gums are destroyed, and the necks of teeth so exposed, that fillings soon become necessary, and in time a ribbon of gold will follow the edges of the gums, as the result of stiff brushes, across the teeth. I prefer a napkin for friction, but remove debris from between the teeth by other means. I condemn all temporizing work; to preserve teeth, must put in a good filling. If a six-year molar, at seven cut out the fissures and fill with gold. If you don't know how to use gold, use

something else. It is a great mistake not to cut out fissures; will soon have to do your work over again, if you temporize. No matter what the age of the patient, do the work perfectly. Soap is a great cleaner; am satisfied with it in my own mouth. It dissolves oily and other deposits that adhere, so that very little rubbing is required. When the gums need local treatment, I use astringent escharotics. They control when I have failed with everything else. I use nitrate of silver when its use is indicated.

Dr. James S. Knapp: Agrees perfectly with Dr. Morgan as regards tooth-brushes. The gums are injured and the teeth grooved. We often find loss of substance on the outer surface that can be accounted for in no other way. It does not look possible, but a simple experiment will illustrate. Place a tooth in a vice, and rub across with a fine point of wood dipped in charcoal. A groove can soon be worn.

Dr. J. R. Walker: Endorses all that Dr. Morgan has said about filling children's teeth, and filling them well, but would sometimes use other material than gold, not because the operator is necessarily ignorant of the use of gold, but because the soft texture of young teeth makes other material advisable. Would never temporize or do imperfect work, for any reason. Does not agree on some other points. Some facts need pointing out. Was glad to hear Dr. Morgan admit the difference in the character of the teeth in Tennessee and the Mississippi Delta. The prevalence of poor, soft teeth in the latter locality is due to the absence of lime-salts in food and drink. Appreciated his eloquent portrayal of the great Mississippi river, but, unfortunately, it is not the river water, with all those lime-salts held in solution, that is used for drinking and cooking purposes, but *rainwater*, which was described by Dr. Stienberg as the "sewage of the air," which is destitute of organic elements. A recent trip through Texas had served to confirm him in his belief that the carbonate of lime is beneficial to the teeth. In the mountains of Western Texas, where the

carbonate of lime abounds, the natives have magnificent teeth, in strong contrast to those of the people in the Mississippi Delta. It is advocated that the mineral elements must go through a preparatory process; that it must pass through the vegetable kingdom, but he is convinced that the aqueous carbonate of lime itself is of benefit to mothers. In Western Texas there is a tract of country where the water is so strongly impregnated with the *sulphate* of lime as to be popularly known as "gyp-water." Had some curiosity as to what effect this form of lime would have upon the teeth, and was gratified to find the teeth of the natives of very superior quality. No grain is raised in that part of Texas; they are stock-raisers; they use St. Louis flour, but they drink "gyp-water," and they have magnificent teeth. Dental operations are required only by recently arrived immigrants. The geologist knows from the mineral formations of a region what its flora and fauna will be. The character of the teeth can be predicted with equal certainty from the same data. The geological formations which decide the quality of the water also decide the character of the teeth. If the absence or presence of lime has nothing to do with this difference in the character of the teeth in the localities described, would like to ask the cause?

Dr. W. H. Morgan: The poorest food has sufficient lime-salts to give each individual three pounds in a year; it will give him all he needs. Yesterday took a trip through certain portions of this city, where the filth was simply horrible. The stench was intolerable; foul gases were bubbling up through the surface-water in the gutters. That is what is the matter with the teeth in New Orleans.

Dr. Walker: Admits the condition of the city to be most lamentable, but attributable to the unprecedented rainfall of the past winter; but with all these bad sanitary conditions, the atmosphere is so purified—the impurities are so continually swept away by the gulf breezes, that we have no typhoid or diphtheritic epidemics, as in other less favored

localities. Was in a certain town in Texas, where the sanitary conditions were equally bad, and where typhoid fever was consequently almost continual epidemic; and yet the teeth were firm and sound.

Dr. B. H. Teague: Whatever may be the cause of decay—whether acids or bacteria, or deficient lime-salts—the average dentist is more concerned with its prevention. The simplest tooth-powder is the best, and that is English prepared chalk. A dentist makes his own tooth-powder; he knows its components; he has a right to recommend it. He gets very busy; his stock gives out; he sends to the nearest depot and orders a supply, for convenience' sake. If the formula is not given, he has no right to recommend it to his patients. Has a druggist to compound a tooth-powder, of which he prescribes the formula, and sends his patients there. One idea as to tooth-brushes that has not been advanced: the bristles should be long—much longer than is generally used—serrated and separated into two or three rows. The bristles should be quite long, so as to carry the powder used in a sweeping manner. Short bristles only scratch; with the long bristles, there is more friction, which is needed for both gums and teeth.

Dr. C. W. Spalding: Does not condemn local applications in the hands of those who use them successfully; has no use for them himself, except where escharotics are needed. As to the constituents of our food, recent careful analysis of fine flour shows that it is not entirely starch; the old ideas on the subject are not correct. There is a network of gluten pervading the starch layers, and consequent distribution of lime-salts all through even fine flour. Every article of food contains enough tooth-material, but we do not get the benefit of that material. It is from defective assimilation. But why? As to the administration of certain elements for pre-natal effects, there is no question as to the benefit derived. If a mother partakes of certain elements, the child is benefited by it. The

general condition prevailing in a family may be avoided in the children. There is enough of the proper elements in ordinary food, but it is not assimilated. But while the phosphates in food are not assimilated, the phosphates as medicine do benefit. *Why*, is not understood. One fact in illustration: Thirty years ago, phosphate of lime was found to benefit in certain diseases of the soldiers in India. The home government advertised for large supplies; bids came from various sources; one was less than half of any other; it was accepted, subject to test; reported absolutely pure; the lime was purchased and shipped to India, and found to be absolutely useless. Why? Investigation showed that it was the mineral phosphate. The lime that had been beneficial had been bone-phosphate. It had been acted upon by animal organisms. We are not able to assimilate mineral elements. It must pass through the vegetable kingdom. Bone phosphate is beneficial; mineral phosphate is useless.

Prof. J. Taft: It is worth while to inquire why it is that there is occasion for so much effort to keep the mouth pure and clean from the sources of impurities. With a clear conception of the causes, we would better know how to prevent. Among the various sources may be named the accumulation of *debris* which lodge on and are retained around the teeth; the imperfect use of the teeth—not sufficient friction from mastication. We use too much food not requiring mastication; soft food, of bolted flour, not adapted to thorough mastication. Those habituated to soft food have pasty deposits, which are very often charged to vitiated fluids or deposition of salivary calculus. This can be avoided by the proper mastication of proper food. The condition of the secretions has also much to do with the condition of the teeth. Another cause is found in the use of improper food, irritating to the mucous membrane of the alimentary canal throughout the tract. The mouth will sympathize, and the salivary glands also. The saliva is also vitiated by undue stimulation of

the glands, as from the use of tobacco. It is rendered too thin, and will not perform its natural functions. If thus habitually stimulated, normal food will fail to stimulate, and fluids will be required to compensate. Saliva is also vitiated, and impurity and uncleanness of the mouth results from the habit of buccal breathing, in sleep, if not when awake. The mouth becomes dry and parched; the mucus is changed; becomes thick and agglutinated; the mouth is clammy if not dry, with an unpleasant taste. This is the cause of the unpleasant taste in the mouth when suffering from a cold, and forced to breathe through the mouth. In every instance where the mouth is thus foul from any of these causes, the teeth are damaged. Shall we disregard all this, and resort simply to the tooth-brush and the tooth-pick? No; we must remedy conditions. If conditions were all what they should be, we should have no more need of a tooth-brush than a dog has. Who ever heard of a dog with foul teeth. If we avoid all causes of impurities, we will have no more use for the tooth-brush than the animal creation. Have known persons who never used a tooth-brush, but whose mouths were sweet and clean and pure. Let every child, every mother, masticate well, use proper food; avoid all causes of abnormal secretions; avoid all irritants and stimulants of the mucous membrane, and they will have much less use for dentifrices and tooth-brushes. Respiration should be entirely through the nostrils. This habit should be carefully cultivated, and every effort made to overcome the opposite habit. Every person in good health will have a pure, sweet breath, if the mouth is habitually closed in breathing, especially in sleep. Education on this subject devolves upon the dentist.

Dr. A. O. Rawls (from the chair): Will Dr. Spalding please give the reason for the bad taste in the mouth referred to?

Dr. Spalding: It results from the evaporation of the watery portions of the saliva, which also undergoes

rapid chemical changes when exposed to atmospheric currents.

Dr. W. H. Morgan: Any person can readily experiment for himself by voluntarily keeping the mouth—say while reading—open for one hour. He will find his mouth foul and sour.

Dr. Spalding: Fermentation will as surely take place in the mouth after eating sugar, as in the grape when the skin is broken. Dr. Taft spoke of irritation of the salivary glands. I apprehend he referred to the mucous glands, as affected by stimulation. The saliva is alkaline, but mixed saliva, from excess of mucus, becomes acid, and by chemical reaction becomes viscid. The changes in the saliva due to mixture, arise from excitation of the mucous glands. The salivary glands are very deeply imbedded.

Dr. Taft: Said that he referred to the salivary glands, as they respond promptly, but agrees also to the vitiation being due to the admixture of mucus secretions. We should do all we can to educate the people in right habits, rather than have to cure disease. Had used the phosphate in mineral form for many years, as he believed with good results. Could cite many cases. Would mention one family, where the father came from New England, and the mother from New Jersey, both having fine, strong teeth. They moved to a sandstone country, where there was no lime in the vicinity. Five children were born, and all had very defective teeth, and lost them early. In many other families in the same vicinity the cause was the same. How much this was cause and effect, we can only judge for ourselves. The water of that locality was perfectly free from lime; what is called "soft water," and the teeth were all bad.

Dr. W. N. Morrison: Would say one word with regard to ordinary food containing sufficient tooth-elements. This may be true, but in the early age of children, not enough of this proper food is taken. The desire for cereal foods—wheat, rice, barley—or a meat diet, is diminished by the

use of *sweets* between meals. They don't get enough of the proper kind of food to supply the elements of tooth substance, because they have no appetite for good, plain food. Their stomachs are filled, and the secretions exhausted between meals, and they refuse good, plain food at the table, because they have no appetite for it. This point should be borne in mind in instructing patients. With regard to the prevention of decay, one promoting cause is the long intervals customary between meals. Decay progresses in this interval. If we ate like the animals—small quantities at frequent intervals—never overloading the stomach, allowing no interval of this work of disintegration, we would have better teeth. As to brushes, I approve of a very nice, fresh brush, with bristles of medium length, and serrated, but ordinary brushes are made hind-side before. The strongest and best part of the brush should be at the end, to endure the wear of friction. For cleansing spaces, recommend narrow strips of rubber-dam, instead of silk-floss; always dismiss a patient with a supply.

Dr. James S. Knapp: Does not agree with Dr. Morrison as regards frequency of eating. Believes that by eating too often the appetite is destroyed. Saccharrine food is very bad: plain, substantial food at stated intervals.

Dr. J. J. R. Patrick: Has listened to the discussion with great interest. It is unboubtedly true that the attempt to convert internal membrane into external membrane, by keeping the mouth open, is the sum total of the whole trouble. Internal membrane cannot be converted into external membrane without creating unhealthy tissues. There is no question that man has advanced from a lower to a higher type as he progresses in the march of civilization. Where vegetation exists, animal life can be sustained. It is not necessary to have limestone in order to have lime. Every blade of grass, every tree, every flower, is at work transmitting the inorganic element to the organic stalk, and then the animal creation finds it, though they never saw

graham flour or cracked a grain of wheat. You cannot send your elements direct to the knee-joint, or the big toe, or to one particular bad tooth. Can you say to the phosphate, "Go!" and have it go direct to the right place? Can you turn the gas on and light one burner, and skip the next? The elements are appropriated in a general way; we try to do too much. We hold out too many inducements that will never be fulfilled, in reconstructing teeth. Animal tissues are thrown out; organic elements are deposited. The forming process of teeth is from center to circumference; the lime-salts are thrown out; the teeth are centripetal, in growth; bones are the reverse. In old age, when a tooth has served its purpose, it has no internal cavity, in its normal condition. There is a filling up, to a certain age, in a permanent tooth; there is a retrograde physiological process. I am satisfied that when a patient is excreting certain elements, it is not necessary to give more, because they don't appropriate what they have already. A tooth is incapable of repair, except in broken cementum, which is similar to bone. Are the teeth of pregnant women broken down to supply the fœtus? I don't think they are, I can't see it possible. Women take more care of their teeth; have greater pride in their appearance; visit the dentist more. I should want very positive proof on that breaking down process. A child excretes no phosphate of lime, or of magnesium, when making teeth, as in later life, nor does a pregnant woman.

Dr. Taft: Is not prepared to endorse the idea that the teeth cannot be nourished by the administration of certain elements, without supplying all other points with the same material. A certain element goes where it is most in demand. If a bone is broken, the proper elements go there to knit it together. Lime does not go to the muscles; it goes to the bones and teeth, where needed. We do not send it; we only have to furnish it, and it will go to the right place; but it cannot go if not furnished. When the teeth are poor, the fontanelles are wide open; there is a

general deficiency. With prompt dentition there is prompt closure of the fontanelles. With poor teeth, the bones are soft—sometimes so much so as to bend without breaking. If the proper elements are administered, they will go where they are most needed.

Dr. W. H. Morgan: Dr. Patrick is a little misty in his physiology, and I do not agree with his osteology. I think the bones are formed like the teeth; it is the same process. This is the view of all comparative anatomists in the world. When the nerves of taste detect a flavor, you have increased flow of saliva—a reflex process. As to Dr. Morrison's idea of not eating often enough, if there is nothing to promote a flow of saliva, too much mucus will be secreted.

Dr. Spalding: Only one word more on assimilation. We know that the blood contains all the elements, and that certain proportions are distributed to different organs. All organs do not take equal supplies of the same elements. Assimilation depends more on the condition of the tissues than on the supply of elements. The heart sends it to the door, but if the door does not open, it will not be received.

Dr. J. J. R. Patrick: It is a lack of function, and it is useless to send additional supplies.

Dr. Spalding: The elements are sent out uniformly. Blood plasma contains all the elements. Here are the elements; take what you require. Assimilation depends on the condition of the tissues; not on the blood plasma. Our food contains all the requisite elements; the blood carries them all. Both of the gentlemen are right, but they both stop short of the main point. A flow of blood to the organ is required to stimulate it to assimilation. The teeth require exercise to excite the flow of blood to stimulate to assimilation. Hard, coarse food creates this condition. The muscle of the blacksmith illustrates the idea. If the arm is tied up, it will waste away. The teeth require exercise, or proper food.

Dr. Robinson, of Michigan: We don't know as much as we think we know about the mysteries of life. Life is a unit, flowing from center to circumference. God is the great centre of the universe, and all nature flows from God, the centre.

Dr. J. R. Walker: One word in reply to Dr. Patrick. We need to supply the elements which are excreted. I do not endorse the chewing of tobacco or gum to excite the flow of saliva. As to the point at issue between Drs. Morrison and Knapp, I think we must "split the difference." Have our eating hours neither too frequent nor too far apart. Allow time for digestion, but not for undue secretion of gastric fluids.

Subject passed.

Dr. H. J. McKellops: What are the arrangements with regard to the exhibition of appliances? As chairman of that committee, I have induced a number of gentlemen to come here, some from a considerable distance, bringing a number of valuable and interesting appliances and improvements, but I have not learned what the arrangements are.

Dr. J. R. Walker, Chairman of the Executive Committee, stated that Friday had been set apart for Clinics, and the exhibition of appliances.

The application of J. Rolla Knapp for membership was announced as having been passed upon favorably by the committee. A vote was taken, and he was declared elected, and his name ordered placed on the roll.

Adjourned to meet at 9 A. M., Wednesday, April 1st.

SECOND DAY—WEDNESDAY, APRIL 1.—MORNING SESSION.

Called to order by Dr. B. H. Catching, 3d. Vice-President.

Minutes of yesterday's session read and approved.

Dr. H. J. McKellops moved that half an hour, after the adjournment of the morning session, each day, be set apart for the exhibition of appliances and improvements. Carried.

Dr. John W. Adams, of New Orleans, was recommended by the committee and elected to membership.

Report of the Committee on Pathology and Therapeutics called for. Dr. Wm. H. Atkinson, chairman, not present; no papers presented. Subject passed.

Report of the Committee on Histology and Microscopy called for. Prof. J. Taft, chairman. No report ready; no papers presented. Subject passed.

Report of the Committee on Chemistry called for. Dr. J. S. Cassidy, chairman, not present. No papers presented. The death of Dr. S. M. Prothro, of this committee, was announced.

Committee appointed by the chair to draft suitable memorial resolutions. Subject of Chemistry passed.

Report of Committee on Operative Dentistry called for. Dr. J. C. Ross, chairman, not present. No papers offered by members of the committee.

Dr. Wm. N. Morrison, of St. Louis, read a paper. Subject: "The Reckless Sacrifice of Tooth Substance in Filling Dead Teeth," which is published elsewhere

A spirited discussion followed the reading of Dr. Morrison's paper.

Dr. J. S. Knapp: While it is undoubtedly true that a large amount of valuable tooth material is sacrificed for the convenience of the operator, the position taken by Dr. Morrison touches the other extreme. The aperture he describes, through which to remove the contents of root canals and pulp-chamber, was too small for possibility. In the case described, he would not have opened through the sound crown, when there was a filling in the tooth already. Could have reached the nerve canals more readily from that direction.

In all cases, would make more generous opening, for convenience of operating and seeing.

Dr. W. H. Morgan: Had listened with interest to the excellent paper. The general idea of preserving tooth-structure is correct. In proportion as you cut away dead-

tooth, you lessen its time for usefulness, because dead-tooth will in time disintegrate. A round opening is more difficult to work through than a slot, however narrow. Considered his next steps radically wrong. The worst condition and the worst time for filling was immediately after removal of contents of dead-tooth. The contents of the tubuli would putrefy, if not disinfected. *Must* give antiseptic treatment before filling, to prevent mephitic gases and periosteal troubles.

Dr. J. S. Knapp: Would ask Dr. Morgan, what is left, after the pulp-tissues have been removed?

Dr. Morgan: The semi-fluid contents of the tubuli, which will putrefy. I cut out the root-canals and pulp-chamber freely, and remove all the dentine, in which the contents of the tubuli are liable to decompose. Fill the roots in much the same way as Dr. Morrison, but has screw threads in the wire. Removed a tooth recently in which there was a ball of ox-chlor. beyond the foramen. Was doubtful about extracing, but glad when I saw the condition, though nature might have expelled it. Would not cut away unnecessarily; had no pride in a large filling, as such.

Dr. Parmley Brown: Dr. Morrison's paper has waked us up. He is old enough and has had practical success enough to know what he is talking about, but I don't advise every one to try his method. He might succeed, and then again he might not. I disagree with Dr. Morgan as to the use of oxy-chlor. Prefer gutta percha. Dr. Morrison's paper should be copied into all the journals. Would wager for his success in filling *immediately*. Ten years ago, had a patient from Charleston. Pulp of ten superior anterior teeth had been devitalized six months previous, at her own request, as she told me, to prevent suffering while being filled. The fillings were all loose; springs of pus exuding. Examined well, and decided to put the dam on and fill them all before she left the chair. "Might as well be killed for a sheep as a lamb!"

Remove all septic matter, and embalm in oil of cloves, and you have a mummy as perfect as of 6,000 years ago. I removed all the dead pulps, burring only sufficiently to remove the fillings. Filled immediately with gutta-percha, and sent her away with warning of possible swelled face. She had no trouble, and ten years afterwards the gums were as healthy as those of a baby. The atmosphere is sweet after the dead dog is removed! Dr. Morrison is right in working through an aperture as small as he can, and I am right in having it as large as I require. I would not remove a permanent filling, if another opening would suit me as well or better.

Dr. W. H. Morgan: Dr. Brown has misunderstood me. I propose to remove all decomposed matter. He succeeded in his case because all matter had decomposed. The tubuli are in better condition when pulps are just removed to absorb antiseptics when there is an old abscess.

Dr. Brown: Mummies were not decomposed.

Dr. Morgan: No; because antiseptics were not then used. In his case, the pulps and the tubuli had undergone all their decomposition, and one hour's treatment with antiseptics was all that was necessary. But after the removal of fresh pulps, mephitic gases will be formed, and give trouble. They will pass through the foramen, and abscess will form. Abscess follows decomposition. If there is nothing left to decompose, you are safe. If everything is removed, you will have no abscess.

Dr. Brown: Where is the proof that the contents of the tubuli will die?

Dr. Morgan: Take a scrofulus patient. Devitalize and fill immediately. In two months you will be satisfied: Your nose will tell you. There will be decomposition in the dentine.

Dr. Brown: I have never made the test, and never expect to have a chance. I succeed every time. The filling goes in in about $2\frac{1}{2}$ seconds after the nerve come out. There is no money in treating dead teeth. Dr. Brown said

that Dr. C. E. Kells, Jr., had said to him only the day before that he had been educated in the New York Dental College, and was taught to treat roots three months; had wasted months in that way. Then someone told him it was useless. He knew it now, and wished he had known it sooner; wished he had never been to New York. There are cases, as when there is an inflamed condition of the periosteum, where it will not answer, but get the channels filled as quickly as possible, every time.

Drs. Morgan and Brown were called to order, as the law of the Association prohibited more than one speech, and ten minutes, to each member, until all have been heard.

Dr. Morgan: I don't understand Dr. Brown. If he has never had an abscess, he is the only man living that can say as much. If there is an abscess within a year, in five cases out of ten, there will be trouble in time; it may not be in five or in ten years, but it will be in thirty or in fifty years.

Dr. Brown: I did not say I *never* had an abscess. In the case of the lady described, I sent her home, anticipating that very trouble, but it did not follow.

Dr. C. W. Spalding: Both of these gentlemen are right, and both are wrong: It all depends on the individual case. In some cases it will do; in others it will not; as in the teeth of young children, for instance, and those of scrofulous subjects. I endorse Dr. Morrison's views, with some modifications. I also found teeth in exactly the condition described by Dr. Morgan, hundreds and hundreds of times. "Shall we fill immediately?" is the question. As a rule, I remove the soft tissues, treat with antiseptics, if required, and fill immediately. As an antiseptic, I use mercuric bi-chloride, 1 to 1,000, in distilled water. If the water is not pure, the bi-chloride may be decomposed, and thus become nugatory. All local medication, except for purificatory purposes, is unnecessary, and often injurious. If the tooth is not so sore as to give pain on pressure, I proceed with

the operation without regard to conditions outside the root. Inflammation of the peridental membrane is due to extension from the pulp, or it proceeds from the effect of irritating gases generated in the pulp-chamber, or canal. If these are rendered pure, and air and fluids of the mouth excluded, you are following nature's methods, and will be successful. Remove irritating causes, and administer proper prophylactics, and abscesses become almost unknown. In medicine I am homœopathic, as some of you know, and the prophylactics are prescribed in accordance with that system.

One word as to Dr. Morrison's method of root-filling. There is only one sure method, or positive operation, by which we can *know* if the filling has gone to the end. If you pump in oxychl., or gutta-percha, *you don't know*, and unless the interior of the canal is perfectly dry, you fail to get the chemical conditions necessary to save the teeth. The gold wire is the only positive method. I used it thirty years ago, but not just as Dr. Morrison does to day. He has improved on the old methods. I think I have tried every method ever known, (except, thank the Lord, that most abominable idea of all—cotton.) I estimate the length of the root, and the depth of the canal, and hammer and file my wire until satisfied that it is a fit. Then I mark the wire, at the open end of the canal, and cut off the exact length. I then pump the canal full of semi-fluid gutta-percha, and *then* introduce my wire up to the point where I *know* it went before. That is to my mind the nearest approximation to positive certainty.

Dr. A. W. Harlan: I was not here to hear the reading of Dr. Morrison's paper, but have listened to the discussion. There are doubtless many young men here who have not had thirty or forty years' experience; but we are all willing to be instructed; we are all desirous of doing the best that is possible. There has seemed to me to be a lack of definiteness to the uninformed. Does all this refer to cases where the pulp is to be extracted? When is the pulp to

be extracted, after devitalizing? You wish to prevent abscess; you must be governed by well-defined and scientific methods. If the pulp is destroyed to-day, according to the laws governing physiology, changes from a physiological to a pathological condition must follow. When we produce an eschar, will nature remove it to-morrow? Eight days will elapse before tissue destroyed by eschar will be removed. Is it not natural that the same law should apply to destroyed pulp? Remove at once? Remove while wet, or adjust the dam, and prevent mixed fluids from entering? The latter will produce putrefaction. The fluid contents of the tubuli must be removed, and everything hermetically sealed. If it is not filled so thoroughly as to exclude air and water, we will have bad-smelling dentine in every case. With the above precautions, we will not have trouble, even with wrong methods. The necessity for treating is an erroneous idea. All that is necessary is to extract the water. With carbolic acid? No. With creosote? Not at all. What, then? I reply, with absolute alcohol. Alcohol will extract the water perfectly, and will not coagulate. As to the treatment of pulpless teeth, no gentleman could fill a pulpless tooth for me, at once, if discharging from the canal, and no fistulous opening. We have no right to inflict such suffering; the consequences may be very serious—may result in death. That all septic matter must be removed, no one will question. If the canal is filled under the above conditions, the alveolus must be bored before dismissing the patient.

The necessity of treating through the fistulous opening is not obvious. If the pulp-chamber and canals are thoroughly cleaned, and filled immediately, there will be no necessity for treatment. Let some one who has tried treating for months, try this treatment. You will see your success. There is no necessity for wasting tooth-substance to reach the canals. I don't care what you do, if you don't use cotton to fill the roots. Seal the apex—no matter what

with—gold wire, lead, gutta-percha, oxychloride. Wire alone cannot possibly make a perfect filling. Have repeatedly extracted teeth with curved roots, not filled to the apex, where wire was used. Must fill with plastics, which will reach the unequal surfaces. The average practitioner is incapable of filling with wire with uniform success; and many do not know how to use plastic materials, either. Oxychloride and oxyphosphate will harden before they get half way to the apex; use gutta-percha—not the little cones which come for that purpose. Never heat gutta-percha in a flame, or in a hot dish; use it cold, and drawn but to its smallest possible compass; sufficiently rigid to go to the apex. I will be happy to show my method.

Dr. Williams (Ky.): I find good features in plain, common sense. In a room where small-pox has died, the carpet and curtains are not left in position to be disinfected. It is not common sense to disinfect surplus material. Remove all surplus material, and then with simple means the room is easily and thoroughly disinfected. As with the room, so with the tooth. Dr. Spalding spoke of the uselessness of treating two or three weeks. Seal the apex; remove the surplus; disinfect. I use a lead point, like the broken off point of a sharpened pencil. Chip off one-sixteenth of an inch. After washing out the canal, I insert this little point, and thus close the door. I then remove the "carpet and curtains." The tubuli contain more than the canals. In every direction I remove the dentine. In a few days I can thoroughly disinfect. Then use oxychloride, or gutta-percha. The door is closed; all is sweet and clean. The whole field is contained in a nut-shell.

Dr. Richie (Texas): Dr. Brown said he has no time to spend in treating teeth. Neither have his patients. The time is not far distant when capping nerves will be left to those who do not attend Associations. We have no right to impose upon our patients; capping nerves is the greatest of all impositions. Beautiful crowns are constructed, but in a little while peridental inflammation sets in; suppuration

follows ; the fine crown must be removed. The result of capped nerves is dead teeth, discolored teeth, springs of pus, septic matter carried into the stomach, the breath tainted, the health injured, neuralgia.

This patient does not come back to the dentist ; he goes to the physician, and there is a big bill to pay. If the physicians only knew it, this neuralgia is due to capped nerves. I am opposed to capping nerves, I strike at the root of the matter in the beginning. I take the nerve out surgically ; use local obtunders, use carbolic acid to coagulate in the tubuli ; keep foreign matter out ; fill the nerve canals with cotton and antiseptics to absorb fluids. In a week I fill permanently. For the roots, have tried gutta-percha, but my instruments go through. Liquid plastics go through the foramen, cements clog before they reach the apex, wire projects beyond. I cut away for a clear opening, and use Robinson's material, dissect it and get long and slender fibres, flow the canal with eucalyptus oil, then introduce one thread after another, until the apex is closed. I then disinfect and wash, and complete the filling. Would do away with capping nerves, as unfair to patients and taking our time to do the same work twice over.

Dr. Walker : This discussion affords a fine illustration of the benefit of attending associations. The ground has been traveled over in all directions. Will not detail my methods, but will give one or two points. In using plastics for roots, close the foramen with gold or lead or whatever the particular case may require. Where gold or lead will not reach in your hands, use gutta-percha. Fill with judgment as well as with your other materials. Be guided by the circumstances of each case, but close the foramen thoroughly ; filling around a corner with metals is beyond my reach, but gutta-percha will do it. I then take a broach wrapped with cotton to pack the oxy-chloride ; the broach will bring away the cotton, but leave the oxy-chloride. As regards devitalization, I am in favor of preserving the nutrient functions. Devitalize when necessary, but save

the nerve as long as possible. Keep a capped nerve under your observations, under a temporary filling for several days. I make the temporary filling of artificial dentine, Hill's stopping, or other form of gutta-percha, or any material easily cut down. If no disturbance ensues within a reasonable period, then cover with permanent filling. This is better than wholesale devitalization, for fear of possible trouble.

Dr. J. W. Robinson (Michigan): Much depends on the instrument with which to fill the canal. Take a spring broach, twice the size of a horse-hair, to carry material to the apex; draw the end across your oil-stone, and blunt it, and it will not go through your material. The canal must be thoroughly cleaned. The best, the common-sense test, is the odor. For thirty years I have insisted that no tooth should be extracted except with the fingers. I use arsenic occasionally, but cap the nerves whenever my judgment dictates it; we are too timid. When oxy-chloride or oxy-phosphate is to be used, mix with carbolic acid to the consistency of cream, and flow over the cavity; then use it thicker, and press hard. It will cause pain for a few minutes. The harder oxide takes up that mixed with carbolic acid. Try it on glass, and you will see how it is lifted, and the eschar is formed.

Dr. Chisholm: Have had some experience in capping nerves. I use the old wood crepsote, or oil of cloves, with oxy-phosphate. Where the symptoms are favorable, the nerve will live ten or fifteen years. I have a thousand cases that are doing good service.

All these different views make the field broader; many valuable ideas have been advanced. Have cured many cases by one treatment. On the other hand, have had cases that required treatment for months, but with ultimate success. In one family of consumptive tendency, it will return every spring. Sometime since, in cutting an apple, I severed the tissues of my thumb. My wife applied spirits of turpentine, and there was no soreness. Just at that time, in excavating

a large cavity for a young lady, I cut the nerve. I promptly applied spirits of turpentine, and sealed it up, and it gave no pain. Have since tried it several times, with the same success. This will perhaps remind you of the medical student who, seeing the hospital physician allow pork to a little girl ill of pneumonia, who recovered, wrote in his memorandum-book, "Pork good for pneumonia;" but his first pneumonia patient for whom he described pork, died.

The hour for adjournment having arrived, the programme for Thursday, April, 2d, Dentists' Day at the World's Exposition, was announced.

Adjourned to meet at 2:30 P. M.

SECOND DAY—AFTERNOON SESSION—WEDNESDAY, APRIL 9.

Called to order by Dr. B. H. Catching. The discussion on Operative Dentistry was continued.

Dr. B. H. Teague said that we often failed in treating pyorrhœa alveolaris, when there was necrosed condition of surrounding bones, because of impure sulphuric acid. As to capping pulps, facts were better than theory. There are two points to bear in mind: First, no pressure on the pulps. Second, fill with a non-conducting substance. In one case where he capped a nerve with Weston's nerve-cap, and filled with oxy-phosphate, within twenty-four hours he had hard work to hold his patient while he removed the filling. Within a few hours he filled again with the same material, first washing gently with carbolized water, and then flowing oxy-phosphate over the pulp, finishing with a good grade of amalgam. The tooth was very tender on pressure, and did not respond to thermal changes, and had the trouble occurred a week or ten days after filling, he would have concluded the nerve had died; but the nerve is alive to-day, responding to thermal changes. A newly-capped nerve will not bear the pressure of mastication at first.

Dr. Reese said that the one important thing in filling roots was to know that no impurities are left. We have a sure test, and that is permanganate of potash. If it does not turn brown in the cavity, there is no impurity. So long

as only cold affects a tooth with capped nerve, it is healthy. If heat is painful, there is inflammation—the nerve is dead or dying.

Dr. H. J. McKellops, of St. Louis, said that the opening necessary depended upon the tooth and the patient, in each individual case. In the case of a young patient, with a large cavity running with the cusp, if not well excavated, the tooth will turn black. Gold must be adapted to the wall of the cavity, to save the tooth. If the top is left intact, you cannot see what to do. In dead teeth, you have got to cut out well, and see what to do. Spoke of the nodule rolled around in the cavity, and finally impacted in the filling (as described by Dr. Morrison.) Said that such a substance was diseased matter, and should be removed; that neuralgia in apparently sound teeth arose from calcified pulps. Asked Dr. Morrison why he left that foreign substance in the cavity; had never heard of such a thing before. Would treat through the process, and be successful, but if the canal was filled with a blind abscess, trouble was inevitable. Cited several very stubborn cases—final success. One case, a young lady with abscess over superior central and lateral incisor. Had been treated by a New York dentist, who made a specialty of alveolar abscess; had been going on four years—lady in poor health, wasting away. Diagnosed filling projecting through the apex, with necrosed bone to the base of the nose. Removed fillings of gutta-percha and cotton from the root; opened up the side of the teeth; removed sixteen pieces of bone. There was no remedy but to remove the teeth. Treated every three or four days, for five or six days. (Exhibited the teeth.) Said, "My friend from New York does not practice what he preaches. I would not dare to cut out as he does, but I cut enough to see what I am doing. As to filling roots with gold, every one knows what I think. I have preached till I am ashamed to say any more. Dr. Clark, of New York, taught me his method. There are cases where gold can not be got in; you must have some-

thing that you can force up—that is, gutta-percha. No matter how skilled a man may be, he can't fill a blind cavity with gold; but you can inject gutta-percha, and drive it up, and do no harm, where gold would go through, and cause excruciating pain.

Dr. McKellops then described a recent case, where the cheek was swollen, and feeling like dough, the abscess approaching an outside opening. Extracted the tooth, with the abscess intact; a round ball on the apex; the root had been filled with gold, which passed through the apex, with an amalgam crown. To handle gutta-percha for root-filling, imbed a stiff broach in unslaked lime, and heat it red-hot, making it so soft as to require careful handling. Wrap with threads of fine cotton; with this you can force gutta-percha where you cannot get gold. (Exhibited another tooth with cotton forced through the apex.) If a man takes pains, he can't be in a hurry—he can't do first-class work in a hurry; he makes himself hard work in the future. Dr. Shepard uses waxed tape to separate—say the bicusids; takes a week, and has no soreness. You can get plenty of room to see what you are doing. I don't pretend to succeed in all operations; I fail, and others fail. We don't always know of our failures; they are tired of us, and don't come back. I am ready to give any man any amount of money that can show me how to do these things in the best manner. I have seen the best gold work fail, and I have seen amalgam fail. I have seen failures with people who take the most exquisite care of their teeth, spending hours on them daily—people with whom money was no object. Gold work failed with them, and they came back. I put in amalgam, and that failed. I put in oxy-phosphate, and renew it every year. It is all I can do. If any man can tell me how to treat such cases, I want to learn. Some one in *The Southern Dental Journal* recommends oxy-phosphate where patient are willing to have it removed every year; it is the nearest approach to success possible in some cases. Gave the following illustration: A young lady with the superior left first bicuspid, with the palatine cusp broken

half-way of the palatine surface of crown; the tooth very frail; the outside wall of enamel cracked, but the nerve alive. The mother standing by, anxious that the tooth should be saved, yet exclaiming, "Stop! Stop!" in her fear that the tooth would be broken off. Three times in seven years I have filled that tooth with oxy-phosphate, and it is in good condition to-day. Such work requires time and practice, but it will secure good results. Of course, we cannot expect perfection with such teeth, and patients must be made to understand this, and expect and agree to have the work reviewed. Cited another case, that of an inferior right second bicuspid; cavity on the labial surface, extending so very far down that the gum had to be pressed away; dentine very sensitive. Had entire success in producing local anæsthesia with the following formula:

Muriate cocaine	.	gr. 1 ½
Spts. alcohol	.	dr. 1
Chloroform	.	dr. 1.

Blistered the mouth, but saved the tooth. In filling root-canals, use chloro-percha. Use No. 10 Swiss broaches; they are highly tempered, and must have the temper thoroughly drawn before using.

(Question.) Will not the chloroform evaporate and cause shrinkage of the mass in the canals?

Dr. McKellops: The evaporation takes place during manipulation, before it goes into the tooth.

Dr. C. W. Spalding: I do not propose to offer arguments against the practice of others. I don't presume a man would advocate a measure if he had not been successful with it; but no one has claimed to fill root-canals with gold only, and have the work perfect. No such claim has been made in the papers read, nor in the discussions.

Dr. McKellops; Did you not say, "Close the apex with gold?"

Dr. Spalding: It does not much matter what material is used, provided you reach the apex; but nobody advocates filling canals with gold wire only, leaving interstices. We

use plastics, as a solution of gutta-percha, but at the same time, to make sure that the apex is closed, we take the measure of the depth of the canal, and cut off the right length. Then having filled the canal with the plastic material, insert the gold wire in the plastic mass, and you drive it into all the interstices, and seal the apex. Much has been said against the process, but it gives the nearest approximation to absolute certainty.

Dr. H. A. Smith (Cincinnati): Would emphasize what Dr. Harlan said—must exclude foreign elements; and agree with Dr. Parmly Brown, to make haste slowly. Take a tooth in pathological condition: animal matter must putrefy; every time we apply antiseptics we make progress towards cure, but must maintain that progress by involution. What is most needed now is the means of protecting a tooth from the invasion of foreign elements while under treatment.

Dr. Taft; Most of the remarks made in the discussion seem to be based on the supposition that dentine is uniform. Must note whether tooth is living or devitalized; whether a tooth is young or matured. Difficult to treat devitalized teeth in young persons—contain more organic matter. If, as Dr. Morgan says, there is decomposition in the tubuli, it must be much worse in young teeth, and there is greater danger of periostial irritation, from emanations passing through this less dense dentine. All these conditions should be recognized and considered. Some adult teeth, also, are less dense than others; some are very soft. This depends on various causes. If the tooth is firm and dense, we can devitalize and fill immediately; we can perform operations that would not be tolerated at all in soft teeth. There are some teeth with which we can do anything we like; others that are difficult to save: others with which success is impossible. The contents of the tubuli do not always undergo prompt decomposition. The evaporation of water from the tissues produces great modification. Different constitutions act differently under irritants. Some take up poisons and eliminate them without disturbance. In others, the slightest irri-

tants will produce violent disturbance. We must discriminate between youth, middle age, and old age; between health and debility; be guided by conditions. We must study the histological character of each tooth. The electrical light is an invaluable aid in distinguishing characteristics of tooth adjuncts. The condition of the dentine also modifies the amount of cutting away; dense teeth have solid walls: in soft teeth, remove as little as possible. As Dr. Morgan said, in dead tooth there is a retrograde metamorphosis,

Dr. Morgan: I take exception to the position of Dr. Harlan regarding removal of watery portions of contents of tubuli. It will be renewed by the periosteum. In proportion as you apply antiseptics and prevent decomposition, you prevent discoloration. So much for the organic matters. I will tell you how you can fill a root and *know* the apex is sealed. If you drill all the way through with a cone-shaped burr, you have a cone-shaped opening; your burr is the model for your filling. Take a cylinder cone of gold, carry it up, and drive it home hard and tight, and you have it sealed. You can't plug a crooked root with gold, and know the result. With the first soreness of periosteum, by watching closely, you can prevent an abscess by applying aqua ammonia as a counter-irritant, and putting the system in a condition to resist inflammation. When an abscess has been treated, the bony tissues are broken down, and there is an abnormal filling up of abnormal connective tissue. When the cause of irritation is removed, nature strives to renovate; the absorbents become active; new tissue is formed, but it is not the original tissue: it is eschar tissue.

Dr. J. J. R. Patrick (Illinois): Roots have all shapes; they are straight or curved, club shaped or twisted; but, as a rule, the internal wall follows the external outline, but you cannot be positive even of this. When roots are filled with wire, it is liable to perforate the apex. I have seen a tooth with gold wire projecting one-half inch beyond the foramen. It is true it had been worn for years without trouble. With regard to fistulas, I have found the treatment easy in the lower teeth; by the law of gravitation, they drain naturally through the fistu-

low opening. But it is different with the upper teeth; they drain through the canal, and if you risk filling at once, you have to rely upon absorption.

Dr. Wm. N. Morrison (St. Louis): The discussion has been too long already, but I wish to reply to one or two points. First, as to what Dr. Patrick says about wire passing through the apex, I doubt if he will ever find a second projecting half an inch. If the wire goes too far on trial, it is very easy to substitute a larger size, until you find one that does not pass. I will gladly illustrate my method in a clinic on next Friday. Select your most difficult cases—either live teeth or dry teeth. If dry, invest them in plaster, so that I cannot know the shape of the roots. I would prefer teeth in the mouth. If in plaster, I will ask you to break them open, and judge of the work in the canals. I will be glad to put it to this test. [Applause.]

Dr. Moore (S. C.): I must challenge one little point in Dr. Morrison's system. He may be able to withdraw all the pulp tissues through an aperture of one-sixteenth inch in diameter, but it would be possible to but very few of us. I would prefer to sacrifice a little more of the dentine of a devitalized tooth.

Discussion closed.

The following new members were added to the roll, having passed favorably the executive committee:

Dr. S. H. B. Bartholomew, Vicksburg, Miss.

" E. B. Robbins, Vicksburg, Miss.

" W. J. Barton, Paris, Texas.

" L. A. Thurber, New Orleans.

" W. L. Smith, Hawkinsville, Ga.

" G. A. Colomb, St. James, La.

Dr. M. W. Williams (Ky.) read a paper describing a new artificial crown, illustrated by a large chart, showing the different portions of the attachment. The following is a brief description of the device, omitting details: Two hollow, truncated cones of soft platinum are inserted, one in the root canal, and one in the artificial crown. The foramen is first closed with the point of a lead needle, and the root canal filled with cement; one of the hollow cones is inserted, and being open

at the end, fills with cement. A short, broad, steel pin, split at both ends, passes from root to crown, with a steel wedge in each slit. An approximal joint being made, and amalgam spread thinly over the end of the root, the crown is driven home, and bitten down into perfect articulation, the wedges expand the ends of the pin so as to fill the inside of the cups, drawing crown and root together, forcing out all surplus material, and securing a perfect joint; the wedging preventing any possibility of opening or separating, and apparently rendering the attachment as durable as the root itself. The device was received favorably, commending itself in being self-articulating, by its strength and simplicity, and by the ease and rapidity with which it can be attached in one short sitting.

After a few questions and explanations, the paper was referred to the committee on publication, and the subject of Operative Dentistry passed.

The subject of Pathology and Therapeutics was now called for. The paper of Dr. A. O. Rawls on pyorrhœa alveolaris, incorporated in his annual address, and read on Tuesday, was taken up for discussion.

Dr. J. R. Walker : Said that pyorrhœa alveolaris had been the *bête noir* of the profession for long years. Regretted the absence of Dr. Riggs, who is entitled to have the disease called by his name, as his researches have at last given us a clue to the only successful method of treatment of what was so long considered an incurable disease. Facts in obtaining best results by surgical treatment alone—uses local applications as adjunct in restoring normal condition of soft tissues after surgical operation has removed the local irritants.

Have found the following very beneficial in inducing healthy granulation, and the filling up of pockets :

Carbolic acid	. . .	1
Tincture iodine	. . .	1
Glycerine	. . .	10

When well mixed, add 5 parts Laboraque's solution. It becomes perfectly colorless, and more volatile than

water. Then add a few crystals chloride zinc; it coagulates, and is very astringent.

Dr. Reese, (N. C.): The most important point is to study the cause. Pyorrhœa is rather a symptom of disease than a disease *sui generis*. From my observations, it is caused by the use of alcoholic stimulants—not immediately, but in the course of years. The use of alcohol increases the uric acid in the system, urea having also a strong affinity for sodium. The deposits never occur until after the destruction of the peridental membrane. Have the deposits analyzed: it is pure uric acid. The deposits occur farthest from the heart's action, and in parts of low vitality. It is confined to men; women never have it until after the cessation of menstruation. Negroes never have it. Remedies which decrease uric acid in the system, as atropine, digitalis, acetate potash, etc., are the remedies for pyorrhœa.

Dr. W. H. Morgan: In accordance with the medical axiom, "remove the cause, and the disease will cease," but I had never heard that the calculi of pyorrhœa were uric acid. It is most commendable to investigate in this direction. Have not had it analyzed myself. As to the other statements: in my own town there are regiments of negroes with genuine pyorrhœa, and women of all ages have it as commonly as men. Have treated at the same time a mother with a suckling child, and her daughter, a girl of fifteen years old. Have treated it in three generations of one family, from the grandfather down, and know that no stimulants were used in that family. When the health is broken down from this disease, as often happens, general as well as local treatment is required. If it is of constitutional origin, it requires constitutional treatment. It is often mis-called scurvy, because of some points of resemblance.

Dr. Taft: There exists a great variety of opinion as to the origin or causes of this affection. We are told of systemic conditions, but we are not told what they are. There is no doubt that an enfeebled condition, in many instances,

promotes it. This may occur from defective elimination. When the teeth are not properly used, there is a lack of nutrition, and the gums are very susceptible to irritants. Systemic conditions may arise from imbibition of pus, in pockets whence it cannot escape. If the tissues are not nourished, or if there is lack of elimination, adverse systemic conditions will result—until this is rectified, local treatment will be of little or no avail—the system must be toned up to better nutrition and better elimination. We must study principles rather than mere remedies. It is a great fallacy to rely on any one agent. We must do the best we can, taking into consideration all the conditions of each case.

Dr. J. A. Robinson, (Michigan): I have given the profession a remedy which I have called Robinson's Remedy. It may be called carbolized potash. I remove thoroughly all deposits, using chisels, cutting toward the necks. Equal quantities of crystals of carbolic acid, and crystals of caustic potash, (with a very little water, unless the crystals have deliquesced,) will form a creamy paste, which will liquify. Make small ropes of cotton the size of floss silk, cut off in lengths sufficient to reach around one tooth at a time, dip the pieces in a bottle and lay on a napkin to absorb the surplus; the gums will slough if too much is used; place in the pocket, or under free margin around the tooth, and leave on one tooth only while cleansing another, the next tooth; a second treatment is seldom necessary, and have never made a third application. When there is much pus, the rope comes away brown, or even black. It would seem to be a specific remedy; produces a change in twenty-four hours that would scarcely seem possible. (Described a number of very extreme cases, with marvelous results.)

Dr. Walker: I hope Dr. Robinson's remedy will do all he claims for it. As different cases require different remedies, one succeeding where another fails, I have given a remedy which I have found very efficacious. Dark

blood changes from blue to red, and looks lively and healthy, and pockets fill up rapidly.

The hour for adjournment having arrived, further discussion was deferred until the next session. The committee on Memorial Resolutions announced the following resolutions in reference to the death of Dr. S. M. Prothro, of Chattanooga, which were adopted by a rising vote:

WHEREAS, it has pleased Almighty God, who doeth all things well, to call from our midst Dr. S. M. Prothro; therefore,

Resolved, That we bow submissively to the divine will, and that we as a profession have lost a worthy member, always upright in thought, just in his dealings to all, capable and efficient, bearing with patience and fortitude the ills of life.

Resolved further, That we as an association extend to the bereaved and stricken family and friends our heartfelt sympathy in their hour of affliction.

G. S. CHISHOLM,
W. C. WARDLAW,
W. H. RICHARDS,
Committee.

Dr. Morgan paid an eloquent tribute to the memory of Dr. Prothro.

Dr. Prothro was a native of South Carolina, and was fifty years old at the time of his death. Graduated when but eighteen yeaps old, and received his medical diploma before he was twenty-one. He took up the practice of dentistry after 16 years of medical practice. He was a man of natural sprightliness, gifted in conversation, and ready with the pen; an elegant gentleman, cultivated, refined, and high-toned; remarkable for the purity and simplicity of his character. His example is one worthy of imitation. His memory should be held in affectionate remembrance.

Adjourned to meet at 7:30 P. M.

SECOND DAY—NIGHT SESSION.

Called to order at 7:30 P. M. The President, Dr. A. O. Rawls, in the chair.

The subject of Parhology and Therapeutics resumed, by the continued discussion of the paper on Pyorrhœa Alveolaris.

Dr. Harlan: Said that opportunities of studying the sailors of the high seas were comparatively rare for practitioners of dentistry in inland cities, and that his practice did not lie much among Irish laborers, but he did not think the deprivation of vegetable food, or the use of salt meat, had any significance in connection with pyorrhœa alveolaris; that their diseases of the teeth and gums were more probably due to their utter lack of all ideas of cleanliness. They might have salivary calculus, but not necessarily pyorrhœa. Such theories as these were condemned. The descendants of the users of salt meat do not inherit pyorrhœa. The disease of the gums after ptyalism does not resemble pyorrhœa. The mercurial diathesis may be transmitted, but not as acute ptyalism. So much for Dr. Rawls' theories of *causes*. He well said that escharotics should not be used, but do not agree that germicides or antiseptics exert no beneficial influence when properly applied. Dr. Rawls stated that the septum might melt away, but the gum is left on the original line. It strikes me that that does not obtain.

In mouth-breathers, the palatal aspect of roots of incisors is affected. Salivary calculus has nothing to do *per se* with the inception of pyorrhœa. After the removal of salivary deposits, the peridental membrane often remains well attached, so that the probe will not pass. Pyorrhœa deposits go to the apex, but not continuous; there is no particular point of large accumulation of serumal calculus, but rather in little islands. The pockets are more frequent on labial and buccal aspects than between the teeth. When on mesial or distal surface, it is usually where the

adjoining tooth is missing. The thorough removal of all deposits is absolutely indispensable; the edges of bone must be broken down, cut away, burred out, scraped out. A frequent cause of failure is the failure to remove the debris. This cannot be done thoroughly merely with a syringe and water. It will often be found necessary to make a transverse slit in the gum, to make certain, thorough work. If made perpendicular, it must be extensive, to prevent pucker of the gum in festoons; thorough work on mesial and distal surfaces only possible by a transverse cut through the gum. On the labial surface it is easy to push away the gum. Exclude saliva, and inject peroxide hydrogen, full strength, as it comes to us. It will make more perfect work than would otherwise be possible. The blood clot which in other positions furnishes nature's protection is not transformed tissue. What we most need is something that will destroy bacteria. The fungus of pyorrhœa is not yet satisfactorily classified. That true pyorrhœa is infectious, I have demonstrated in one mouth, when I purposely introduced pus from pyorrhœa beneath a healthy gum; you may call the result satisfactory or unsatisfactory, but the tooth was lost. The moral is that our instruments must be cleansed in preparations that will destroy spores, if we would not propagate the disease. There is no advantage in over-treatment. Every three or four days is enough, with intervals of rest in which we allow nature to work.

Dr. James R. Knapp: The disease under discussion is not a new disease. It is not Riggs' disease more than anybody else's; for it is older than Riggs himself. His treatment, however, is good, in the thorough removal of all deposits and debris. If it were caused by tartar, all deposits of tartar would be accompanied by pyorrhœa and there would be no pyorrhœa without tartar, neither of which is true. Failure in thorough removal of all deposits, debris and dead bone, resulting either from lack of boldness in the operator, or from the flinching of the patient, is the usual cause of failure to cure. Use chloride of zinc in pockets, place a few granules on a piece of glass with just

enough water to dissolve; apply with instrument of wood; after three or four minutes, wash out, and follow with tincture iodine. It will be slightly uncomfortable, and cause temporary discoloration, but will have a beneficial effect. It will harden up the gums, and prevent bleeding. Cannot agree with Dr. Atkinson that the alveoli will be reproduced after the disease is arrested. It may not be impossible, but it must be the work of years.

Dr. J. R. Walker: If any one man in our profession deserves to have his name perpetuated, it is Dr. Riggs. Thorough surgical operations; the adoption of the surgeon's axiom, "cut beyond the dead line;" the thorough removal of everything down the sound bone, is the true story. Dr. Riggs was the first to go that far; to teach us, and make us appreciate the necessity of daring to do this. Too much credit cannot be given him, for to him we owe the possibilities of cure, under the modern system of treatment which is the result of his investigation.

Dr. A. O. Rawls (calling Dr. Wright to the chair): I find that I am still severely misconstrued. My object in reading the paper was to put myself right before the Association. Dr. Knapp and Dr. Harlan both attribute to my statements entirely contrary to my views. I have contended that when the process is broken down there is no possibility of absolute cure. Before the process has been reached, there is a simple inflammatory action that may be checked, and the progress of the disease arrested for a time, but the conditions are still present.

I have never found a case that was not due to the use of mercury or of salt. The victims of malarial poison have an abnormal craving for salt. It is the only diseased condition that creates this craving. You also know the prevalence of pyorrhœa in malarial districts. See also the condition of sailors and Irish laborers, who live almost exclusively on salt meats. I have made it my business to seek out these two classes of people, and invariably find these conditions present. My theory may be wrong, but the coincidence exists. It has been said that "reproduction

can take place. Syringe the pockets with this and that, and allow the tissues to build up."

Will live tissues grow over dead bone when the process has been denuded of the membrane? There is no possibility of reproduction when the connection between the tissues and the bone is broken. In soft tissues, the function of nutrition is resumed. I do not say that mercury will always produce this disease, but I do say that in nearly every case mercury will produce conditions that will render possible this peculiar disease.

It is touching on dangerous ground to deny that it may be produced by fungi or bacteria, but it is certain that they follow the destruction of tissue—the resultants, not the starting point. Antiseptics or escharotics to destroy these animals are outside of the question; our object is the restoration of tissues, not killing germs; that does not cure the disease. We must remove the sources of irritation; remove the dead bone and debris. It is a simple process, but it is all we can do; with the after protection of the parts.

Dr. Taft: What does Dr. Rawls consider hereditary mercurialization? If a person has had this special mercurial impress, is its transmission from parent to offspring probable or possible?

Dr. Rawls: It is as transmissible as any other condition of tissue. Conditions are transmissible. Every molecule is marked by its surroundings, as seen in the curl of the hair, or the color of the eyes. What is heredity? It is the transmission of the peculiarities of the parent to the child. Diet, surroundings, environment, cause peculiarities which are transmissible in the tissues of the gums the same as elsewhere. It is in this way that the sins of the parents are visited upon the children unto the third and fourth generation. The tissues of mercurialized persons are by no means as strong and firm as those of others. They are readily broken down. This condition is the same in transmitted tissues as when acquired.

To be Continued.

EDITORIAL, ETC.

AMERICAN DENTAL ASSOCIATION.—We direct special attention to the meeting of this association, to be held in Minneapolis, Minn., commencing Tuesday, August 4, 1885, at 11 A. M. From the notice of arrangements and attractive natural features of the country as portrayed by Dr. Crouse in the call for this meeting which appeared in the last number of this JOURNAL, the attendance will no doubt be very large, and the proceedings of great interest.

HEADACHE.—The following comments are made by the *Medical and Surgical Reporter*, quoting an article from the London *Lancet* on "Headache."

"It is such a common thing to hear a person say, '*I have a headache*,' and it is as equally common to hear the reply, '*It will soon pass off*,' and we so constantly find such recommendations for its relief as a cup of tea, or a nap, or 'vinegar and brown paper,' and we so seldom inquire into the *cause*, unless the headache is so continuously persistent or some other prominent symptoms imperiously force our attention to a close examination, that we reproduce the following remarks from the *Lancet* as well worthy of careful consideration:"

"Headache, although so common an affection, possesses a peculiar interest on account of the tantalizing obscurity in which its cause is often shadowed. Depending upon one or two main physiological principles connected with the passage of nervous impulses and the calibre of cerebral blood-vessels, it yet arises in response to so many different stimuli, that, practically, the branches of its original stem of structure, its distributive variations, are perplexingly numerous. Among the forms but recently described and named, though probably as old as art, is the 'academy headache.' Critics and doctors have vied with one another in trying to translate this term according to the rules of medical logic, but have not, so far,

been able to agree as to its meaning. In venturing to put forward our own opinion on the subject, we think it best to notice the different circumstances which tend to produce in the frequenter of galleries that general sense of fatigue which is often the precursor of pain, and then to note the special stimulus which brings out of this chaos the formed and local ache. It should be noted that all do not suffer from this form of headache while of those who do, some are less and some are more affected. Fatigue may be the limit of annoyance with a certain class. They are heavy-limbed and heavy-headed, languid, but no more. The forces at work upon them are the warmth of the crowded room, the summer sunshine pouring through the skylights, the listless rotation or circulation, rather than walking, through the rooms, and the weariness of much divided attention. Being robust and used to go about upon their feet, they soon lose the feeling of languor after its causes cease to act; and if their eyesight be equally healthy, they suffer no strain in these organs. There are other persons, of weaker organization or more sedentary habits, in whom pain quickly follows fatigue, and it is felt, for certain reasons, chiefly in the head. Among these reasons we must note the fact that in the standing position the blood, driven by a languid heart, reaches the head with greater difficulty than when recumbent. Anæmia, is one cause of headache. Anæmia, too, is associated with changes of arterial calibre which constitute the usual cause of megrim. Under these conditions; also, the giddy malaise of a loitering gait is painfully perceptible. Concentrated attention increases the uneasy sensation. The frequently constrained position of the head has its influence. It would be strange, moreover, if ocular movements had no share in the production of this complex indisposition. Let any one converge his eyeballs to an acute angle, as in squinting, or let him direct a sidelong glance of extreme obliquity, and a single effort will convince him of the pain of such muscular effort. No doubt this is the pain of muscular tension, acute and so far abnormal; but it is also possible to induce a similar pain from the strain of too frequent muscular action within the normal limits of accommodation to distance or other movements of the eye. Ocular pains of

this kind are felt as an aching about the middle and back of the head. The scrutiny of paintings or engravings, from the many points of interest which have to be noted, requires a considerably greater exercise of the muscles of the eyeball than is called for in ordinary life. In this fact, established as we have already stated, on a basis of fatigue and general muscular and nervous strain, we have probably the usual exciting cause of the form of headache we have been discussing.

MONTHLY SUMMARY.

DANGERS OF WEARING SMALL DENTURES.—*By John Trude Fripp, L. D. S. R. C. S. I.*—In the *British Journal of Dental Science*, for the first of February, a case is recorded in illustration of the danger of sleeping with artificial teeth. From the fact that the plate passed safely through the alimentary canal I should judge it must have been a very small one. Certainly patients should be warned of the danger of keeping an artificial denture in the mouth at night; but I would go a step further, and urge that there is considerable danger incurred in wearing very small dentures at any time. A lady came to me only a few months ago with a small vulcanite plate, carrying the two upper bicuspid teeth of the right side, which she told me she had swallowed, but happily passed safely per rectum. They had become displaced during dinner, and passed into the oesophagus with the food before she became aware of what had happened. I had warned her previously of the danger, as the attachments were not secure, but the plate had been worn for several years and the danger was not appreciated until the accident occurred. It may, of course, be urged that had the dentures in these two cases not been so small the wearers could not have passed so happily through the accidents, but on the other hand is it not reasonable to urge that had

they been *much* larger the possibilities of their being swallowed at all would have been much reduced.

I have for some time given up the making of small cases, and even for a single front tooth prefer to put in a palate.

A small case always requires clasps, which in the larger cases may very often be dispensed with.

There are certainly three distinct advantages in making the cases larger. (1.) Much greater firmness is ensured. (2.) The natural teeth are not so likely to be injured as by the tight clasping of bands and wires. (3.) And there is much less likelihood of a case being swallowed.—*Dental Advertiser*.

AN APPETITE FOR MORTAR.—The following peculiar case seems to possess sufficient interest to warrant reproduction. It is reported in the *Lancet*, January 31, 1885, by Dr. Charles E. Adams:

W. T.—, aged three years, is a pale, unhealthy looking boy, decidedly rickety, with thickened bones at wrist and ankle joints, carious teeth, and enlarged abdomen; he is also backward in his walking, not having full locomotive powers. His mother informed me that up to two years of age he was a fine baby; he then had an attack of bronchitis, and was treated at a London hospital, where he was offered admission, which his mother refused. The attack left him in a weak state, and soon after that time he showed signs of rickets. About eight months ago he exhibited a great desire for eating mortar. The mother discovered his propensity by observing that the wall near his bed was stripped of paper and holes picked in it. On inquiring into the cause, she found that the boy used to eat the mortar, and his eagerness after it was so great that he would get, even in inclement weather, into the yard and pick the walls, and if prevented he cried. On occasions the child has been deprived of his mortar, and invariably when it is kept from him he vomits his food, and when had recourse to the symptom ceases. So at the present time it is the ordinary routine of his little sisters to collect mortar, which must not contain too much sand, as he is particular in the quality. Lime-water has been substituted, but this the child refuses to be contented with, and will have his food in a more solid form.

He is now suffering from small-pox, and, on waking up in the night, cries for a piece or two of lime before going to sleep again. The quantity consumed during twenty-four hours is rather more than half of a teacupful. His mother tells me he has never been weaned, and her custom has been to suckle her other children up to three years of age. To corroborate the mother's statement, I have frequently seen him partake of the mortar, which he crunches up and swallows with great relish.—*Med. and Surg. Reporter.*

MORTALITY OF INFANTS.—In an article on the above subject, Dr. J. H. Hanaford, writes the following regarding food given to infants. There is a possibility that the defective teeth seen in children is due to the improper starchy diet here mentioned.

"Many of our infants are sacrificed by improper feeding; the errors relating to times, to kinds of food given and to quantity. Most are fed too often, the ignorant mother supposing that the proper way of keeping the "wind out of the stomach" is by keeping that organ so gorged with food that no external "wind" can enter it, while the only "wind" to be feared is generated in the stomach, in consequence of excessive feeding. While some infants are fed but three times a day (the calf but twice,) I claim that, as soon as possible, or within a few days from birth, the three-hour system should be adopted—in ordinary cases—and strenuously followed, the time between meals to be gradually increased with advance of age. No meals in the night, at least, after from four to six months. *Never* but one.

"Again many babes are brought to the table, eating about the same food taken by the family, which is as sensible as to provide them with the same clothing which is worn by adults. It is known by some, and should be by all medical advisers, and mothers, that the infant saliva, before the appearance of several teeth, is not provided with the necessary diastase for the digestion of starchy substances, without which starch cannot be properly digested and assimilated.

"And yet, babies are fed on pastry, rice, fine flour bread, arrowroot, corn starch, and the like, literally so starved as not

to grow and be vigorous, like the babe properly cared for by an intelligent mother. Some, at the suggestion of an ignorant medical attendant, are fed on a large quantity of water, combined with a little cream, a "vile compound" containing but little to nourish the babe, much less than *skimmed milk*. In this connection, it is proper to say that every true mother wishes to nurse her own child, this act constituting a very strong bond of sympathy and affection, besides being natural, and therefore healthful to the child.—*St. Louis Med. Journal*.

THE INCIPIENT STAGES OF INEBRIETY.—Dr. T. D. Crothers, whose facilities for experience in all questions connected with alcoholism are very great, contributes a most readable and instructive article to the *Alienist and Neurologist* (April, 1885,) which he thus summarizes:

1. The study of inebriety reveals a well-marked disease passing through various stages, traceable by many and complex signs and symptoms.

2. The incipient stage seen before spirits are used is marked by dictetic delusions and other symptoms of nerve and brain irritability, all of which seem to depend on heredity or some obscure injury to the nerve and brain centres.

3. A group of symptoms can be found in most cases that may be termed pathognomonic, and will be seen in the later stages fully developed.

4. These early symptoms appear after the first toxic use of alcohol, and in some cases go on to full development, or are held in abeyance by some unknown force.

5. Practically, the recognition and study of this stage opens up a field of prevention and cure that will attract great attention at an early day.—*Med. & Surg. Reporter*.

TEETH WITHOUT PLATES.—It is often very desirable to retain the roots of the natural teeth, specially if they are strong and in healthy condition, or if they can be made so, because there are a good many methods of inserting teeth by engrafting crowns on these roots and making them strong and perfect in every respect, without the annoyance of a movable plate. The resources of the skilful dentist are so numerous that he is not confined to a rut of experience and is not thwarted in his en-

deavors by a limitation of methods. Those who have made advancement their watchword have devised ways and means which are only to be made known to be appreciated. This advice then is to all—do not insist on methods which may be inferior, but leave the matter to the riper judgment of your dentist.—*Dental Guide*.

CALCIFICATION OF THE TEETH.—At any time prior to the “eruption” of the teeth, the enamel can be effected by hygienic measures, for good or for ill. And I feel sure that enamel may be improved in structure, even after twelve years of age, by proper regimen and diet. I *know* that the dentine may be. The already formed enamel is not as hard before birth as after more months of life.

If a child, at twelve years of age, has teeth poorly calcified, it, undoubtedly, has its bones in the same condition. That condition cannot be ascertained, as the bones are covered with soft tissues. The bones might be as poorly calcified as the poorly calcified teeth of a child, and yet be practically good for use, and grow no worse, while badly calcified teeth easily decay.

I have had a great deal of positive experience in improving the dentos of children from three to twenty years of age. I feel very certain that I have so instructed the expectant mother, as to cause the teeth of her child to be better than her own.

I improved the dentos of my own teeth after I was fifteen years old, by adopting hygienic habits; and I am sure that I have given my six children better dentos than their parents or grandparents had, by the same methods.

ST. LOUIS, MO.

HENRY S. CHASE, M. D., D. D. S.

THE
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ARTICLE I.

SOUTHERN DENTAL ASSOCIATION.

SEVENTEENTH ANNUAL SESSION.

Reported by Mrs. M. W. J. for Southern Dental Journal.

Continued from Last Number.

Dr. Taft: How permanent is this effect of mercury?
Is it never eradicated?

Dr. Rawls: I do not say that. Changes are taking
place all the time in man, in his relations and environment.
All these have their bearings on the laws of heredity.

Dr. Taft: When tissues have been affected by an
agent, does the effect continue after the agent is expelled?

Dr. Rawls: The tissues can change, and do change;
but an impression has been made which renders the tissues
susceptible to irritants. The impresssion is made on each
molecule; a change is made in the constitution of the
molecules; the general impress is on the molecules, and it
is transmittible; not the agent itself, as mercury, for in-
stance, but the impress made, is permanent. It is like
making a new chemical compound by the addition of an-
other element.

Dr. Taft: The transmission of types inherit in the constitution of physical peculiarities, as in hair or eyes, is admitted by all; but that such accidents as the exhibition of medicines with evanescent effects varying with the power of the system to rally, that an impress so temporary as the effect of mercury, is transmittible, appears to me doubtful, to say the least. There are some things that are never eradicated; that are so permanent as to be ineradicable, as syphilis, for instance, which may be, and doubtless is, transmittible, but I doubt the transmission of the mercurial influence. The system may be weakened and broken down, and children consequently not robust, but the transmission of short-lived accidents appears doubtful to me. It is dangerous ground to accept such theories.

Dr. Morgan: I want to ask if all radical changes made in the system, and continued, are transmittible?

Dr. Rawls: If not, you could not live a moment. What makes you what you are? Not subtle influences that can neither be felt, seen nor handled, but the food you eat, the air you breathe; they make you what you are, and their effects upon your system and your tissues are transmittible.

Dr. Morgan: Then how is it that we who are lame all our lives have athletic sons? An eye knocked out is not transmitted. Reproductive alveolus is never in the original form. It will be largely increased in bulk and strength. I once saw a man who carried a large piece of the outer plate of his skull in his hand. New process was being formed, with healthy tissues. The periosteum is reproduced, and granulation takes place.

Dr. Robinson: Dr. Morgan has told me that the rheumatism which caused his lameness was inherited, and we do not know that he will not transmit it.

Dr. Cushing (to Dr. Rawls): What are the physical signs of these transmitted conditions?

Dr. Rawls: *Pyorrhœa alveolaris* presents different aspects when transmitted than when acquired. In transmis

sion, the tissues are softer and less healthy; there is not the same integrity; they break down more rapidly. The lameness of Dr. Morgan not being inherited is no evidence that the conditions which made it possible were not, or that he may not transmit to future generations, though not to his son. The world did not grow in a year. The transmission is in general conditions, not in local form; in types, not the accidental impress from an abnormal element.

Dr. Walker: The fact is that the more we search for and understand causes, the better we can treat the effects or results. The observations of Dr. Rawls lead him to look upon salts and mercury as factors of causation. The deposit of calculus is evidence of misdirection of elements.

Dr. Fountain (Texas): In the Brazos bottoms, pyorrhœa is very prevalent; perhaps from malaria, perhaps from mercury. Most of my patients say they have been salivated.

Dr. Patrick: There is no doubt that the physical impress is transmitted. Proofs are very strong. A concatenation of circumstances bringing about certain results, account for those results. To illustrate: In Sedalia, Mo., a gander, in foraging for food along the railroad, got under the wheels and had his wings broken. The next spring a number of young goslings were hatched with broken wings. A photograph of the group was sent to Chas. Darwin. At his request, the gander was placed the next spring in another flock six miles away from the railroad. There was no more broken winged goslings. Circumstances and surroundings were all changed.

We will probably never know *why* one family for several generations have the two first fingers missing, even first cousins sharing the same peculiarity. There is no explaining it. It is so; that is all. The fact is established, but why or how we don't know. We find this illustrated in the teeth as in the other organs.

Dr. J. A. Robinson: I can cite one family when for

four generations, to my knowledge, the grandfather, father, daughter, and her little child, have no upper lateral incisors.

Dr. Teague (S. C.): Cited the cases of two well-known families in South Carolina who have been edentulous for generations. Also another family known for three generations as inheriting a hideous deformity of double hair lip.

The discussion was closed.

Dr. J. A. Robinson, of Jackson, Michigan, then read a paper entitled "How to Increase Your Usefulness."

This paper was replete with sound advice addressed especially to the younger members of the profession, embodying the wisdom gained by the experience of a veteran in the service, "Father Jerry," as he is affectionately called by all who know him well, having passed the limit of three-score years and ten. He began by quoting the well-known saying of Daniel Webster, "There is always room at the top," regretting, however, that the most competent dentist, he who has reached the top of the ladder in professional ability and professional estimation, was apparently little appreciated by the community in which he lived, judging by his position on the financial ladder. Push, without ability, will accomplish nothing, and ability without push will not remedy this state of things. Individually, we only catch glimpses of the truth, like the gray before the dawn. It required a Franklin, then a Morse, then a Field, to perfect the telegraph. The beginning of a new truth, when first seen, seems to threaten to sweep us beyond the ancient shores we thought secure. In the great inundation of the light of to-day, it is hard to distinguish what is solid ground. Our improvements grow with our affections. Being just to himself and to others, the affections of a just man are wounded by failure; he must abandon the means and measures which occasioned the failure; hence his improvement. To be successful, you must do the things that other men do, not do and to do this requires study and effort. The first means to this end is to read all the journals, that

you may know what others have done, and what is left undone, for you to attempt. If the same article is published in three or four journals, read it three or four times. It would not be published so often if it was not worth it. As special fields of study, take diseased teeth and gums. This is a broad but comparatively new and uncultivated field to the average dentist. The same is true of artificial crowns, which are rarely attempted except in large cities; correcting irregularities is another important branch that is comparatively ignored by the average practitioner, while one of the most delightful branches of our art. It broadens the field, and affords relief from the ordinary routine of chair-work. It develops high art, and elevates the dentist in the eyes of community. It reveals new beauties in the human face divine, correcting deformities that would be remedied only by the sacrifice of good teeth for the substitution of artificial ones. This is a field far more practically useful than the embryonic, microscopic, and other studies upon which the student spends so much time. The cultivation of the fraternal feeling in the profession is one of the most dignified means of securing increased patronage. Let the people see that we have confidence in each other, and they will have more confidence in us. It is the rule of society everywhere. Secrecy and acquisitiveness are twin sisters; together they dwarf the mind. Hidden somewhere, like diamonds lying in the depths of the ocean, of untold value when found, are the materials capable of being so combined as to give us that ideal filling which shall truly restore the mutilated tooth to its original form and usefulness. If my premonitions are true, this will yet be found. Who among you will be the finder? One of the first qualifications for success is to have the courage of your convictions, and personal force enough to impress your patrons with the principles and truths you wish to instill; make them feel your enthusiasm as you feel it yourself. We may love the past, but we must look to the future. There is an immense realm of possibilities yet

unexplored. It once seemed that Mozart and Beethoven had exhausted all the possibilities of musical sounds, but Mendelssohn and Wagner revealed new harmonies undreamed of by the old masters. Sometimes we think we love the truth when we only love our own ideas of what is true. We are here to fulfil the end for which we were created; it was not in the scheme of Providence that man should be sick, or that we should lose our teeth. The main business of the dentist is to save the natural teeth, by the best means, and with the best material within his reach. Our success will depend on our ability to make our work permanent. Artificial dentures only serve to make things bearable till we go down to the grave. A man is not fit to be a dentist unless he acts on his principle. We must deal with principles above mere mechanism. The truths of science, the laws of nature, the law of justice and right, of truth and love, must be unitized in a profession, to make it felt in the world. Cleanliness is the first law of nature; God is constantly washing all nature with His dews and rains. Man also must be obedient to this law. Filth, fermenting and putrefying, is the cause of decay. Tooth-extraction is not a part of our business. It is not a part of our mission to assist nature in working out the law of evolution by which the human race may become toothless. Edmund Burke said, "Where bad men combine, good men should combine." We should band ourselves together against the bands of charlatans. And all this we must not only believe ourselves, but we must make the world believe it. Belief lies back of conduct, as force lies back of motion. It is only what is fully believed that is acted up to. And so, the last but not the least means to increase your business will be modest, dignified advertising; direct and indirect; by card or by newspaper; by the omnipotent power of talk. By the free use of printer's ink we elevate and enlighten the world. An important matter for consideration is the lack of sufficient compensation for our labor. The world is full of equivalents; man is ever unwilling to give more than he receives.

The demand for cheap dentistry is founded in popular ignorance of the value of the teeth. Here the press is the most efficient means of spreading abroad the truth. There is less general information regarding dentistry and the teeth than on other subjects. Here we have the key to the situation. We must make the people a part of ourselves, if we expect their patronage. There are trades unions to protect the working people; there are conventions to lift the masses; there are expositions to enable the people to behold the world at a glance. We owe this to ourselves and to a long suffering humanity; to the rising generation. We owe it to the progress of the age; we owe it to a profession that has out-stripped all others in rapid advancement. Consultations in medicine are paid for, whether treatment follows or not; the lawyer has his retaining fee; the dentist is only expected to give his time for nothing—to spend more time in gratuitous examinations than he does in actual labor. Information regarding the value and the care of the teeth should be embodied in school-books, from the primary to the graduating class. Light should be shed on this subject by the daily or the weekly newspapers. The man who will thus stand by his convictions has also the right to attach his name to such information. And when we have done this, we shall have our reward.

I have followed my profession for forty-nine years, and I have always tried to do well, but I am free to confess that I have never felt the responsibility of my calling as I do to-day. Rubens said, when he was ninety years old, that he had just begun to improve. We will increase our business just in proportion as we know what to do with tooth sinners to save them, and what to say to tooth-saviors to make them faithful to their high calling.

(This is but a brief abstract of a paper which was also of practical suggestions, and information as to the latest means, methods and materials in operative dentistry.)

The Chair: This most excellent and practical paper is now open for discussion.

Dr. Taft: It is very late. I move that the discussion of this paper be postponed until the next session. Seconded and carried.

Adjourned to meet at 9 A. M., to proceed to the grounds of the exposition, for the celebration of Dentist's Day, Thursday, April 2d.

Friday set apart for Clinics and the exhibition and explanation of Appliances.

Next regular session Friday, 7 P. M.

THIRD DAY.

Thursday, April 2d, being Dentist's Day at the World's Cotton Centennial Exposition, no regular sessions were held.

Assembling at Tulane Hall at 9 A. M., the visiting and resident dentists, with their lady friends, proceeded in a body, some two hundred and fifty strong, to the foot of Canal street, where a steamboat waited to convey them up the Mississippi river to the Exposition grounds. Their crescent-shaped badges attracted much attention, and the exclamation "What fine-looking men!" was frequently heard. The trip was a delightful one, affording a fine view of the busy city, with its warehouses and elevators lining the river's edge; its many tall steeples in the distance; the broad streets forming avenues of living green, converging to a common centre, like the sticks of an open fan, from the crescent-shaped city front. On the opposite side of the river lie the suburban villages of Gretna and Algiers, while lining the banks on either side lie at anchor vessels from across the broad ocean, and steamers from a hundred tributary streams. Reaching the Exposition landing, a halt was called on the margin of a little lake, under the shade of a gigantic live oak tree, draped with waving streamers of gray moss, where the group was photographed, facing the Exposition buildings, with the Mexican headquarters in the rear. Thence they repaired to the Music Hall, in the main building, where front seats had been re-

served for their use. Seated on the platform, and grouped around the speaker's stand, were representatives of the Board of Management of the Exposition, and a number of the most prominent members of the dental profession. An address of welcome on the part of the dentists of New Orleans was delivered by Dr. A. G. Fredricks, and responded to by Dr. A. O. Rawls, of Kentucky. An eloquent and appropriate address of welcome and congratulation, from Capt. S. H. Buck, Acting Director-General of the Exposition, was echoed by Col. F. C. Morehead, Commissioner-General. After brief remarks from others, and music, they repaired to the banks of Lake Rubio, to witness a special drill of the United States Life Saving Service. Thence to one of the large dining halls, where an elegant cold collation was served. The party then scattered over the grounds and buildings, to enjoy the day as best suited individual inclination. The main building, the Government building, the Art Gallery, the Horticultural Hall, the Mexican buildings, were all centers of attraction, the crescent badges of the S. D. A. being seen everywhere.

FOURTH DAY.

Friday, April 3d, was set apart for Clinics and the exhibition and explanation of Appliances. Mr. J. W. Selby, of the S. S. White Co., furnished the hall with all the necessary chairs, brackets, spittoons, etc. Simultaneous clinics drew together numerous animated groups.

Dr. Wm. N. Morrison illustrated the portion of the paper read by him giving his method of filling root-canals with gold wire, through a very small opening, not more than one sixteenth of an inch in diameter, in the centre of crown. The committee appointed to prepare the teeth selected those with the most crooked, curled and twisted roots that could be found in their collection, one in particular having a very remarkable double angle like a letter Z. The teeth were imbedded in blocks of plaster in such

wise as to give no clue to the length, shape, or direction of the roots. The work was closely watched, and many were the predictions of the wire passing through the apical foramen on the one hand, or of failure to reach the apex on the other. The canals being first filled with gutta-percha, the slender gold wire was manipulated dexterously and rapidly, through an opening in the center of the crown scarcely larger than a pin-hole. When the work was finished, the plaster was broken away, and the teeth eagerly broken open, when lo! not a single failure was to be recorded. In every case the gold was found to reach the apex exactly, to seal it securely, and with the gutta-percha forced into all the interstices, the canal was perfectly filled. All doubts were dispelled as to Dr. Morrison's ability to do all that he claimed. Whether anyone else could do it remained an open question.

Many gathered around the chair where Dr. E. Parmly Brown, of New York, with the electric mallet and spring pluggers of his own design, built up a crown of a left superior molar which had been nearly destroyed by malpractice with the file. The pluggers used were of a new design, the portion just above the point being tempered to a degree of elasticity that obviates all risk of crumbling down the margins of enamel. The separation between the teeth for knuckling was obtained entirely by the force of the gold driving the teeth apart at the point of contact. The contour of the crown, cusps, and masticating surface was perfectly restored.

Dr. Bonwill, of Philadelphia, gave a clinic with his mechanical engine and mallet.

Order was called at 3:30 P. M., that those having appliances on hand might have an opportunity of explaining them. Dr. H. J. McKellops, chairman of the committee, said that there were many interesting and valuable things on exhibition, that were worthy the attention of all present; that neither trouble, time, nor expense had been spared in getting them here; that some things were patented, some

were "secret preparations," some were freely given for the benefit of all, but that he hoped respectful attention would be given to each. The articles on exhibition were: A novel and very simple articulator, invented by Dr. Westmoreland, of Columbus, Mississippi; a lathe head-piece (owner and inventor not present to explain); a tooth-powder bottle stopper, with a slot in the side for convenience of placing the powder on the brush, the invention of Dr. C. E. Kells, Jr., a regulating spring for expanding the arch, invented by Dr. E. S. Talbot, Chicago. The spring is of piano wire, the tension of the spring increased by being coiled in the middle, the spring interfering much less with articulation and mastication than either jack-screws or the coffin-plate. Dr. Miles, of Charleston, exhibited a new mouth-piece for facilitating the administration of nitrous oxide gas, and dispensing with the aid of an assistant; Dr. Williams, of Kentucky, a new motor-power for engines and lathes, which is perfectly noiseless, with band which cannot slip; that gives much greater power than any other, and capable of from two to ten thousand revolutions a minute, as tested with the gauge; Dr. J. W. Smith, of Newport, Rhode Island, stiff paper disks with a rim of sand-paper for finishing cervical walls and proximal fillings; Dr. B. S. Byrnes, of Memphis, Tennessee, a new regulating appliance, or rather method, which commends itself by its extreme simplicity. It consists of merely a very thin, elastic band of 22 carat gold, hooked around the first molars, or most available posterior teeth, and bent into the interstices between the teeth. As the anterior teeth yield to the constant, gentle pressure of the elastic band, and space is gained, the band is straightened and shortened as much as necessary, and again indented to hold the teeth in the new position. This is repeated as often as necessary, until the symmetry of the arch is attained. If a gap is to be closed a gold band is hooked around the teeth to be drawn together. If special action is desired upon any one tooth, a rubber block is placed under the gold band, but no rub-

ber rings are used, and no threads tied. Casts were exhibited showing the application of the principle, and the very remarkable results obtained in a very short time, with very little soreness of the teeth or discomfort of the patient, and very little time spent by the operator in applying the apparatus. The appliance was highly commended by Dr. McKellops.

Dr. J. A. Robinson, of Jackson, Michigan, exhibited rubber plates lined with fibrous metallic material, and also with vulcanizable gold, a material which does not corrode, or tarnish, or wear off. The injurious effects of contact of the rubber with the mucous membrane is thus avoided, while a beautiful finish is given to the plate.

Dr. Edwards, of Des Moines, Iowa, also exhibited specimens of black rubber plates made by a new method, which produces light, elastic plates, highly polished on both sides when they are taken from the flask, without the aid of any new apparatus.

Dr. J. R. Walker, of New Orleans, exhibited a modification of the Coffin plate, having the spring so adapted as to be attached to the front teeth, to draw them in while expanding the arch laterally. An interesting sketch was given by Dr. McKellops of Dr. Coffin's experience in "giving away" a good thing. At the Medical Congress in London, in 1881, when he gave this appliance to the profession, he had on exhibition a peck measure full of plates, that had done duty in more than twenty-five thousand cases. He had more than he could do with the help of two or three men, but after he had so generously demonstrated his method, everyone took it up, and his business fell away from him entirely when he no longer had the monopoly.

Dr. Bonwill exhibited his mechanical mallet and engine, explaining the difference between his and all others, the disadvantage of his electric engine and mallet being the necessity on the part of the operator for a thorough knowledge of chemistry and the laws governing electricity.

The new engine and mallet also greatly expedites the work, enabling the operator to do in forty-five to seventy minutes what would otherwise require four or five hours.

Dr. Morrison exhibited and explained some very interesting specimens of Japanese dentistry; plates with cusped teeth, carved from hard-grained wood, and stained to order, *black* for married women, as a mark of distinction and all for two or three dollars a set. Also Japanese tooth-brushes, of banyan root; the end beaten or bruised till the fibres take the semblance of a paint-brush.

Dr. Morrison also exhibited a gold crown that had been presented to the Southern Dental Association fifteen years ago, but which had been in use three years previous to that date, thus invalidating the several patents on the gold crowns now on the market.

Mr. J. W. Lambert, of the St. Louis Pharmaceutical Co., exhibited samples of Listerine and Mentated Camphor, "proprietary medicines," but not *secret preparations*, as the formula is given on the label of each bottle. Listerine, though favorably known in the medical profession for some time, has but recently been offered to the dentist, as a scientific compound possessing valuable antiseptic and disinfectant properties and specially adapted to dental and oral surgery, on account of its absolute safety, and freedom from objectionable odor and taste.

Mr. Wm. Evans, of McKesson & Robbins, New York, exhibited samples of the various preparations of cocaine, now being so largely experimented with as an obtundent of sensitive dentine, inflamed gum-tissues, exposed pulp, etc.

The Executive Committee announced the following applicants for membership:

T. J. Knapp, New Orleans.

Wm. Crenshaw, Atlanta, Ga.

R. E. Watkins, Eutaw, Ala.

A. E. Wofford, Starkville, Miss.

C. R. Rencher, Enterprise, Miss.

Who were duly elected and their names placed on the roll.

Adjourned to meet in regular session 7:30 P. M.

Friday, April 3d, 7:30 P. M.—B. H. Catching, Third Vice-President, in the chair.

Report of the Committee on Dental Literature called for.

Dr. B. H. Catching, Atlanta, Chairman, read a paper, subject, "Literature and a Prophecy" (published in June issue.)

Dr. Brown: As a guest of the Southern Dental Association, I recollect saying, on one occasion, that I was not quite full enough for utterance. Although I have been magnificently treated on the present occasion, I am not *too full* for expression. I have but a few moments to spare, however, so don't get discouraged. I shall not talk long. I am sorry to meet so few men from the North. I am sorry *for them*, for they do not know what they are losing. It has not been properly advertised. It would not be one hundred thousand men; it would be an army of a million men that would come and capture New Orleans with the arms of friendship and love, if they knew the welcome they would meet, and what there is here for them to see. My train is probably whistling. I must bid you adieu. [applause.]

The subject of Dental Literature resumed.

Dr. E. S. Chisholm (Tuscaloosa) read a paper. (published in May issue.)

DISCUSSION.

Dr. Spalding: Every profession is undoubtedly aided by its literature. In our own profession, periodicals and standard works are sufficient in quantity, but deficient in quality. Progress must be sought in that direction. Our text-books are deficient in certain branches. In materia medica and and therapeutics, almost *nil*. In other lines they have grown almost beyond our needs. Text-books are usually written by teachers. We have depended on medical men as teachers, and consequently as authors, in those branches.

They know comparatively little of their application to dental therapeutics. Very much of what we know is not in the text books; it has been learned from experience, and recorded in our journals. Medical men, as such, are not qualified to teach, or write books for, dental students. The remedy? We must bring forward men from our own ranks to teach in these departments, and to furnish the text-books we require. All the chairs in every faculty should, as a rule, be filled by dentists. It has been said that if physiology is a science, the man who can teach physiology can teach dental physiology. Practically, this is far from being a fact. Unless a man expects to become an author, he will not be thorough. There are very few thorough physiologists, even among medical men. Education in the fundamental branches is only partial. Few are qualified to teach chemistry, as applicable to our profession. Unless a man is well grounded in first principles, he is not qualified to teach. He must also understand the practical application of the principles of science to our profession. We depend on medical men to teach our students what they themselves are ignorant of. We must draw from our own ranks to supply this deficiency.

Dr. B. H. Catching: In attending associations from year to year, I see exhibited gold, amalgam, mallets, engines, etc; everything for manual use is brought before the body, but I have never seen a single volume of our literature laid upon our table: I hope our Southern Association will take steps to be furnished by publishers with copies of each and every new publication issued, to be examined by the profession at their annual meetings. I would have this made a part of the work of the Committee on Dental Literature.

Prof. J. Taft: Great improvement can yet be made, but when we look back to forty years ago, and note the improvement made in that time, in our literature, it seems almost a miracle. Then we had no literature. We had but three or four standard works, and the beginning of our periodicals; but now, see our monthly supply of dental literature! I think we may conclude that some progress has been made.

Examine the pages of one of those early journals, and compare with one of to-day, and again we see the progress.

Our literature needs improvement in its literary aspect. Our permanent work—our text-books—have not kept pace with our journalism; but new men are using strong pens, and our text-books will soon equal those of other professions. Every avocation has its special literature. We must train up writers for our profession. Every man should keep a record of every step in advance. Young men should be pressed to engage in this work. If all would do this, our literature would speedily improve. Many who now write are poor writers, it is true, but we should blame no one who does his best, but encourage him to further efforts. Reference was made in the paper to lack of suitable works in certain lines. Let those who think it ought to be better strive to make it better; there is no one to hinder, the way is open. Most of the books we have are designed for those already experienced; there are no elementary books; no clear, simple books for beginners. That is the great need of to-day. It is an easy matter for those in practice to give information for those who are experienced, but it is not so easy to write for beginners. There is no elementary work on anatomy. If any one can be stimulated to prepare graded books for our profession, he will have attained a great desideratum. We need elementary books on anatomy and physiology. Would you put Gray, as a first book, in the hands of a young dental student? We should have an elementary work designed for our own students. The common school books of to-day are better than those used in our colleges. We should have a series of brief works that a student could readily master and retain. The nomenclature of anatomy and pathology ought to be improved. It should be anglicized. The student needs to be familiar with two or three extra languages. The bones and muscles should have plain English names. Students must have helps to more rapid progress. What if our periodicals do contain some advertising matter? That is no disadvantage. If a

man pays for 40 pages of literary matter, and gets, for nothing, 50 pages more, which tell him where to get what he most needs, is he the loser? Some men turn and look for the new advertisements first thing, and then examine the literary portion, if they have time left! Most of the journals are owned and published by the men who manufacture the goods you must have; they could not be sustained independently.

Dr. J. R. Patrick: I think Prof. Taft's position in regard to elementary works in our colleges, not tenable. There are elementary books in all our high schools, and a youth has no business in a college who has not already mastered these elementary works. Gray's Anatomy is plain and simple, and told in few words. Nothing could be plainer.

Dr. J. R. Walker: What is most needed is elementary instruction in hygiene in our primary schools. Such teachings as, when put into practice, will enable the scholars to enter the high school, and go thence to our colleges, with sound minds in sound bodies. There is much lack of primary education in hygiene. Success in after life depends on the health of the body as well as on the cultivation of the brain.

Dr. O. Salomon (New Orleans): I am surprised to hear the depreciation of American literature. No nation on earth has what America has. German and French dental literature consists almost entirely of translations and extracts from American journals. When I came to America, I thought I knew something about dentistry. I had studied in Paris, and in Berlin, but when I got to Baltimore, I found I knew nothing. As to the advertising pages, if a man has profound knowledge, his dirty coat is a matter of little consideration. The German and French journals have no advertising pages, but neither have they any reading matter worth reading.

Dr. E. S. Chisholm: Our literature is just what we make it; it is the reflex of ourselves; it is evolved from the demand. We pay for it because we feel that we need it to

help us in doing our best for our patients. It is a fact well known to all who teach science that popular teachings are not correct. We must learn the first principles, in all branches, by the inductive system, gradually growing and broadening out.

Prof. J. Taft: The majority of our students, coming from the high-schools, where the elementary sciences are popularly supposed to be taught, have but the merest smattering: nothing that prepares them to take up Gray as a starting point. A student in mathematics is not given algebra or the third part arithmetic, to begin with. He must start with the elementary principle; and so it is in all branches. As geographies and arithmetics are graded, so must the sciences have graded text-books: from the primary schools, up through the high-schools, to the college. Prof Ford and others have prepared question-books, and the students study them out, taking the question-books as a guide to study, and the text-books as statements of facts. We should have little primers of 20 or 30 pages, of elementary principles, in which the student should be as thoroughly grounded as in the alphabet or multiplication table. He should have from ten to twenty preliminary lectures, before undertaking laboratory work. Though foreign journals may translate or copy our record of experiences, we are indebted to them for the fundamental principles of science underlying our practicable work. Our foreign brother is warranted in speaking more freely on this point than I can do.

Dr. Spalding: I would call the attention of the Association to an illustration of the principle laid down. Gray's Anatomy is regarded as the best text-book on anatomy; the work of a most celebrated anatomical author. But turn to the pages of Dental Anatomy, and you will find a mere reproduction of that which was written by Goodsir many years ago. This fossilized statement has been handed down without alteration or comment; there is only one chapter, and that one entirely erroneous, from the modern stand-

point. Must we wait for some medical man to study this subject out and write it up for us? No; we must draw upon our own resources, from our own ranks. That is the only way out.

Dr. Patrick: Gray's Anatomy is the text-book for the general practitioner of medicine; for the professional man. It does not purport to be a guide to any specialty, as of the eye, or the ear, or the throat. There are other text-books intended for men who are well-informed, but not professional. Carabelli (Vienna, 1826) gave us a valuable work in the beginning of the century, though no credit is given him. He took up the work where John Hunter left off. It is a work of world-wide celebrity, as authority of comparative anatomy. There is no lack of text-books for professional men.

Dr. A. W. Harlan (Chicago): The members of this Association are not schoolboys to be taught the rudiments. The trouble is not in the lack of text-books; it is in the lack of study of those we have. The great trouble with text-books is that they are too elementary; they are not exhaustive. There is too great a multiplication of primers. Men think they know it all, and study no further. Science is not to be taught by primers—we have health primers, science primers, biological primers, etc. They contain a mere smattering, and put forth insignificant ideas. Revised editions of the books we have, and the study of those books by the younger men, is what is needed.

Prof. Taft: The class of books that Dr. Harlan names is not what I referred to. The primers serve a good purpose. His argument would cut down the progressive, inductive system. Gray's Anatomy was not written under the histological light of to-day. It contains much that requires modifying. I agree with Dr. Catching that copies of the new publications should be brought before the association. That in itself would be a good report on dental literature. It would make a more positive impression than a written report. Would like to see such a report at every meeting.

Dr. B. H. Teague (Aiken, S. C.): I think it only right that this Association should take public recognition of the work of Mrs. M. W. J.; a work that has not only a national reputation, but a world-wide fame. I move that we tender the thanks of this Association to the author of the book entitled, "Letters from a Mother to a Mother."

Prof. J. Taft moved an amendment adding that the Association recommend the book to all practicing dentists for circulation.

Dr. C. W. Spalding: Having had an opportunity of examining a copy of the recent revised edition, I would say that it does not do justice to the author. The workmanship does not correspond with the contents. The work itself is the very best of its class; has no equal, in my judgment, for placing in the hands of mothers.

The motion, as amended, passed unanimously, and was ordered so recorded.

Prof. Taft moved that the author be requested to prepare a revised edition free from the errors and faults referred to. Had examined the book, and was prepared to endorse what Dr. Spalding said of its value. It was intended for distribution among patients, but every practitioner ought to read it. Moved that the author be requested to prepare an edition free from error.

Dr. C. W. Spalding: Though agreeing with the sentiment, would doubt the expediency of the measure, as an edition of 5,000 were just from the press, and the resolution would imply censure of the publishers, as the faults were faults of workmanship and typographical errors, etc.

"Mrs. M. W. J." was introduced to the members of the Association, and in a few words expressed her gratification at the reception her work had met, and the kind words spoken, explaining that the text had been very carefully revised for the new edition, and that the typographical and other errors were entirely due to the haste in which the new edition had been issued, in order to have it out in time for examination by the Association; that haste, however, having defeated its own object.

The motion of Dr. Taft was withdrawn.

The subject of Dental Literature was passed.

Dr. H. J. McKellops desired to call attention to the subject of the Code of Ethics—that he should probably tread on somebody's toes, but was only sorry for their corns! He wished to call attention to the matter of giving certificates—a subject to which he had been giving some attention. He knew that itinerants were in the habit of cutting out these certificates and pasting up whole columns, to which they call the attention of patrons. Many of our own members have their name in print, attached to recommendations of articles of which it is very doubtful if they know the constituents. Look at the list of certificates to Holmes' Sure Cure! Do they know what this is? I propose to buy a bottle and present it to our distinguished chemist, Dr. Harlan, for analysis. I have fought this practice for years. If you want to get your name honorably before the public, buy a quantity of the books of the lady just mentioned, put your name on them, and distribute them far and wide. It will be better for yourselves, and good for your patients.

Report of the Committee on Clinics called for.

Dr. McKellops moved that the subject be passed, as the time was very short, and there was much business that must be transacted—the election of officers; selection of time and place of meeting, etc.

Carried.

Proceeded to ballot for time and place of meeting.

Nashville was selected, the time being fixed for the fourth Tuesday in May, 1886.

Drs. E. Telle, New Orleans, and M. S. Read, Corsicana, Texas, were elected members and enrolled.

The election of officers was now had, resulting in the election of

Dr. C. W. Wardlaw, for President.

Dr. B. H. Catching, of Atlanta, Ga., First Vice-President.

Dr. J. Rollo Knapp, of New Orleans, La., Second Vice-President.

Dr. E. D. Hammer, of Galveston, Texas, Third Vice-President.

Dr. E. S. Chisholm, Tuscaloosa, Ala., Corresponding Secretary.

Dr. R. A. Holliday, of Atlanta, Ga., was re-elected Recording Secretary.

Dr. H. A. Lowrance, of Athens, Ga., was re-elected Treasurer.

Dr. W. H. Morgan, of Nashville, Tenn.; Dr. G. F. S. Wright, of Columbia, S. C., and Dr. W. H. Richards, of Knoxville, Tenn., were elected as the Executive Committee.

The newly elected officers were then inducted into office.

Dr. Jas. S. Knapp conducted the newly elected President to the chair. In a few well-chosen words, Dr. Wardlaw returned thanks for the honor conferred, begging the cordial support and co-operation of the members to make the next meeting equal the present in interest and benefit; proposing to make his administration a working one. He hoped that all members of committees would willingly fulfil their duty, or give early intimation of inability to do so—let us come up as a host, supporting and helping each other, making this a great society for good.

"Mrs. M. W. J." was elected an honorary member of the Association; the Secretary requested to give formal notification of the same.

The following resolutions were introduced by Dr. J. R. Walker, of New Orleans, and unanimously adopted:

Resolved, That the Southern Dental Association desires to extend a vote of thanks, in token of its profound appreciation of the very generous action of the Board of Management, the Trustees and Faculty, of Tulane University, in affording to us and to the National Board of Dental Examiners the free use of their hall and committee rooms, day

and night, during the full term of our meetings. Also to Mr. J. W. Selby, for his liberality in furnishing the hall with the chairs and other appliances necessary for clinics. Also for his general assistance in receiving and entertaining the members of the Association. Also to the press of the city of New Orleans for their enterprising daily reports of the proceedings.

Resolved, That the thanks of the Association be tendered the retiring president, Dr. A. O. Rawls, for the able and judicious manner in which he has performed the onerous duties devolving upon him during his term of office.

Dr. Clifton, of Waco, Texas, moved that the thanks of the Association be tendered the dentists of New Orleans for the pleasant entertainment at the World's Exposition. Carried.

Dr. Walker moved that the Secretary and Treasurer be included. Carried.

Adjourned to meet in Nashville, Tenn., on the 4th Tuesday in May, 1886.

ARTICLE II.

ON THE AVAILABILITY OF CERTAIN ANTISEPTICS IN THE PROPHYLACTIC TREATMENT OF THE ORAL CAVITY.

BY PROF. W. B. MILLER, A. B., D. D. S. BERLIN.

In the *Independent Practitioner* (page 283—1884), and *Dental Record* (page 341—1884), I published a table giving the results of a series of experiments on the antiseptic action of a considerable number of medicaments used in the treatment of the oral cavity. A few new materials have since been added, and I here produce the complete table.

Antiseptic	Concentration necessary to prevent development of micro-organisms.
Bichloride of Mercury	1 — 100,000
Nitrate of Silver	1 — 50,000
Peroxide of Hydrogen*	1 — 8,000
Iodine	1 — 6,000
Iodoform	1 — 5,000
Naphthaline	1 — 4,000
Salicylic Acid (Crystals)*	1 — 2,000
Benzoic Acid*	1 — 1,500
Permanganate of Potash.	1 — 1,000
Eucalyptus Oil	1 — 600
Carbolic Acid	1 — 500
Hydrochloric Acid	1 — 500
Biborate of Soda*	1 — 350
Arsenious Acid*	1 — 250
Chloride of Zinc	1 — 250
Lactic Acid	1 — 125
Carbonate of Sodium	1 — 100
Listerine*	1 — 20
Alcohol	1 — 10
Chlorate of Potash*	1 — 8

Those substances designated by a * were tested upon a pure culture of one of the most common ferment organisms of the mouth, the others were tested upon mixtures. In the majority of cases a stronger solution will be necessary to sterilise (or prevent development in) a mixture than a pure culture, and where solid substances are present, as in the saliva, (particles of food, &c.), the fungi resist still longer the action of the antiseptic.

It must furthermore be readily apparent to every one that the real value of these materials must not be set down as proportional to the numbers in the table above. To say that the bichloride of mercury is, for dental uses, 200 times as valuable as carbolic acid would be as little admissible as to say that dynamite is, in proportion to its greater power, more valuable for industrial purposes than horses.

The question of the availability of different forms of energy, which has long been one of greatest interest to physicists, merits also in the study of antiseptics a thorough consideration. A partial solution of this question I have endeavored to present in the following notes. I have employed in each case the highest concentration that may be readily used in the human mouth as a wash or on the brush.

The substances tested will be found in the following table :

The 1 per cent. solutions of benzoic and salicylic acids (in 20 per cent. alcohol) are rather too sharp to be ordinarily used in rinsing the mouth, especially the latter solution; they may, however, be applied on the brush. The same is true of listerine.

Since, in rinsing the mouth, one does not keep the liquid in contact with the teeth longer than a minute, we need as an antiseptic mouthwash a substance which is capable of devitalizing the micro-organisms of the oral cavity in one minute or less. In my experiments for determining such substances, I have used the following method. I first prepared a tube containing a pure culture of one of the more important fungi of the human mouth, we may call this the *infecting tube*; second, a tube containing 0.5 c.c. of the antiseptic to be tested, we will call this the *antiseptic tube*; and third a number of tubes containing 5.0 c.c. of culture liquid or culture gelatine, these we will call the *culture tubes*.

A small drop or bead is conveyed from the infecting tube to the antiseptic tube on a loop of fine platinum wire, and then at intervals, varying from $\frac{1}{4}$ min. to 15 min., beads are conveyed from the antiseptic tube to each of the culture tubes in succession, one bead to each tube. These tubes are then kept at the temperature of the oral cavity. If the fungi were *all* devitalized by their passage through the antiseptic, the culture tubes remain clear, otherwise they become cloudy in a period varying from 7 to 60 hours.

These experiments should be doubly controlled: 1st, two culture tubes should be infected, using only sterilised water in the antiseptic tube; these two tubes should become cloudy in seven to ten hours, and if either of the other tubes become cloudy in the same time, it indicates that the antiseptic through which the fungi were passed had no effect whatever upon them.

The retardation in the appearance of the cloudiness will give a measure of the action of the antiseptic in those cases where a complete sterilization was effected. Second, the experiment should be repeated, using only sterilized water in both the infecting and antiseptic tubes. In this case the culture tubes should remain indefinitely clear. Should they become cloudy, it would indicate clumsy work on the part of the experimenter, and his experiments would be worthless. It is advisable to sterilise the air of the room before performing these experiments.

The results will be seen in the adjoined table:—

Antiseptic.	Time of exposure necessary for Sterilization.
Salicylic Acid, 1—100	$\frac{1}{4}$ min.
Benzoic Acid, 1—100	$\frac{1}{4}$ “
Listerine	$\frac{1}{4}$ — $\frac{1}{2}$ min.
Salicylic Acid, 1—200	$\frac{1}{2}$ “
Bichloride of Mercury, 1—2500	$\frac{1}{2}$ — $\frac{3}{4}$ “
Benzoic Acid, 1—200	1—2 “
Bichloride of Mercury, 1—5000	2—5 “
Peroxide of Hydrogen, 10 per cent,	10—15 “
Carbolic Acid, 1—100	10—15 “
Oil of Peppermint	10—15 “
(In agreeable strength for Wash.)	
Permanganate of Potash, 1—4000	over 15 “
Boracic Acid, 1—50	“ 15 “
Oil of Wintergreen (in agreeable strength“	15 “

It will be seen at a glance that of the substances tested in this series, only four are available for the prophylactic treatment of the human mouth. These are bichloride of

mercury, salicylic acid, benzoic acid and listerine. Of these four I think the bichloride is without doubt the most effective, because its action continues longer.

In the attempt to sterilise the oral cavity a very serious difficulty is encountered in the fact that the antiseptic cannot in many cases be brought into contact with all portions of it. The free surfaces may become sterilised, but portions less exposed, especially the approximal surfaces of the teeth, fissures, cavities of decay, &c., escape the action of the antiseptic unless it may be kept for some length of time in the mouth. It is here that the bichloride of mercury (1 to 2500) possesses a decided advantage; after the body of the liquid has been put out of the mouth, the traces remaining continue their action until they have become diluted 120 times, this substance, in the proportion of 1 to 300,000, still having a retarding action upon the development of fungi. It appears also to be more penetrating than either of the other three available antiseptics. Unfortunately, however, it possesses one great disadvantage—its highly poisonous character. It seems, however, scarcely possible that any harm can result from its use in so dilute a form. The maximal dose of corrosive sublimate *pro die* is 0.1, and if we suppose that each time the mouth is washed with the 1 to 2500 solution (once daily), 0.5 c.c. of the solution gets into the system (a very high estimate), then it would be 500 days before the amount which may be administered in one day would be reached.

As just remarked, the possibility of any bad result seems almost excluded, and yet the element of certainty is lacking, and though I use the solution myself continually, often as strong as 1 to 1000, I hesitate to recommend it to my patients.

Considering the great interest which this question must possess for every dentist at least, I would recommend members of the profession to test the matter by experiments upon themselves and report the result. In no other way can a satisfactory solution of the question be arrived at. For

self-experimentation I would advise the use of a solution of strength 1 to 1000, with sufficient oil of wintergreen to disguise the taste. It has, furthermore, been claimed, that a solution of bichloride of mercury corrodes the teeth; this, however, needs confirmation.

As to salicylic acid, some say that it decalcifies the teeth, others deny that it has any effect of that kind. Buch (*Journal of Mat. Med.*, 1880), after having used a solution of salicylic acid, in strength 3 to 1000, for some weeks was obliged to discontinue its use, because he noticed "a curious feeling in his mouth, the teeth became softer, and their surfaces rough, through the formation of salicylate of lime." On the other hand, a chemist in Berlin has used a much stronger solution for over 10 years. His teeth when he began were in a deplorable state, but in a short time he succeeded in permanently arresting the progress of caries, of which there is now not a trace in his mouth, while the old cavities are brown and hard. No evidence whatever of any deleterious action upon the teeth can be seen. It seems, however, fully well established that salicylic acid is a substance which must be used in the mouth with great caution, to say the least.

The somewhat weaker benzoic acid might be substituted for salicylic, provided it also should not prove to have an injurious effect upon the teeth.

Particularly noteworthy is the rapidity with which listerine acts. It appears to be one of the strongest and safest of the available antiseptic solutions. It owes its efficiency in all probability more to the boro benzoic acid which it contains than to the eucalyptus.

In comparing the two tables given above we notice what appears to be very great contradictions. Why does the peroxide of hydrogen, which in one series stands very high, fall so low in the other? and why should listerine, which is 40 times weaker than a 10 per cent. solution of peroxide of hydrogen, effect a sterilisation 30 times quicker? I can account for this striking difference only on the suppo-

sition that the rapidity with which a given antiseptic acts is by no means necessarily proportional to its ultimate strength. It is necessary first to all that the antiseptic pass through the cell membrane before it can act upon the protoplasm of the organism. This passage seems to take place very quickly in case of some substances, and comparatively slowly in case of others, although the latter, once through, may act more powerfully than the former. We must also bear in mind that the materials in the proportions given in the first table only prevent the development of the fungi, while by the proportions in the second the complete devitalization is accomplished. There is a very great difference between the two. Many substances and conditions prevent by their mere presence the development of fungi without in the least rendering them incapable of development when they are brought into the proper medium. We need, of course, for most dental uses substances which produce complete sterilisation in a short time of contact.

It is furthermore an important fact that the substance which it is wished to sterilize may so act upon the antiseptic as to materially lessen or destroy its power. In this respect the permanganate of potash is very sensitive. Some antiseptics are liable to lose in strength with time. A preparation of peroxide of hydrogen from the best source in Berlin lost one-third in two months. I was particularly surprised and disappointed in the results obtained with this substance. I hoped to find in it a more effective and available antiseptic than any which we now possess, but in this I was completely deceived, its slowness of action unfitting it almost altogether for dental uses. It may act more quickly upon putre-factive organisms. This question I will determine by further experiments.—*Dental Record*.

ARTICLE III.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The last ordinary Monthly Meeting of the above Society for the present Session was held at 40, Leicester Square, on Monday evening, June 1st, Mr. C. Spence-Bate, F. R. S., President, in the Chair.

Mr. Oakley Coles, in the absence of the Librarian, announced the receipt, as an addition to the library, of Dr. Herbst's work on "Filling Teeth with Gold by the New Method."

Mr. Redman remarked, with regard to a case that he showed of absorption of a first molar consequent upon the pressure of the bicuspid, that the tooth which had caused the absorption was so low down that the crown could hardly be seen, and at the time of consultation it was mere conjecture that the pressure of that tooth might be the cause of the pain the child was suffering from. The patient was fourteen years of age, and the amount of absorption in the tooth was very surprising.

He also showed a split bicuspid. There was nothing in any way to account for the fracture, and it must consequently have been from "explosion of the pulp."

The President showed the model of a case of a split second molar which he had treated, first with elastic bands and afterwards with a little gold wire tied round to bring the parts together. He had then treated the tooth with chloroform, drilled it out, and filled with amalgam. The tooth gave every sign of being once again very useful.

Communications were also made by Mr. Andrew Wilson, Mr. Maggs, and Mr. Coles.

Mr. C. S. Tomes made a communication on

SOME EXPERIMENTS ON AMALGAM FILLINGS.

He said that he felt almost ashamed to bring before

the Society the very small number of experiments he had made lately with amalgams, especially when he considered the very careful and extended tests which had been made by Dr. W. St. George Elliott. The experiments he wished to mention were very few in number, but inasmuch as they were of a different kind from those made by Dr. Elliott, and were all of a practical tendency, he thought it well to place them before the Society that evening, especially as it would be some time before he should be able to continue his experiments.

The direction he had taken up was the question of water-tight fillings made by amalgams. He had only used plastic amalgams in his experiments, as he considered that they wanted an amalgam which was sufficiently plastic to be easy to work. This was not the case with a dry amalgam. The only thing which had induced him to make the experiment he had done was that Dr. Bonwill had showed him at Philadelphia, last Christmas, some amalgam fillings of exceptional excellence, and had also exhibited his method, which he (Mr. Tomes) considered to be quite different from what he had before seen, it being, in fact, virtually to squeeze the amalgam into the cavity of the tooth. Dr. Bonwill's method was to put the amalgam into the cavity in a very plastic form, make a pad of amadou or paper and so squeeze the amalgam into the cavity, removing from time to time the more plastic portions of the amalgam which would squeeze out of the cavity. In certain cavities Dr. Bonwill used the adjoining tooth as a matrix; and in cases of the cavities in two teeth meeting, Dr. Bonwill filled the space as one, and then cuts through the amalgam between the two cavities.

Mr. C. S. Tomes said the great difference between the usual method and that employed by Dr. Bonwill was, that the mercury from the amalgam was practically squeezed out from the cavity, and not done before inserting the plug. He (Mr. Tomes) had in using amalgams discarded all varnishes. If the stopping was water-tight in a cavity the most

penetrating ink stain could not get in. He had heard it said by some that Draper's ink was too strong a test, but he did not consider that such was the case. If a plug were really water-tight the ink could not stain it; if it did stain, it was quite evident that contraction in setting was the cause, or that it could never have been a water-tight filling.

He had found that if he took some Bonwill's amalgam, mixed in a tolerably plastic form, and then packed it into the cavity with burnishers, he did not get a water-tight plug.

In the experiments which had been carried out by Mr. Baldwin and himself, they had both found that if they plugged a tooth by Dr. Bonwill's method, they could depend upon their plug being water-tight.

This applied also to several other amalgams which they had experimented with in addition to Dr. Bonwill's.

If at any time they had an amalgam filling which was not water-tight, the edge should always be looked to, as he had found that in cases where the cavity had a thin feather edge, leakage was invariably the result. This seemed to be a very important point with regard to a cavity for an amalgam filling (it was of course the reverse for gold fillings.) It was unfortunately in some cases unavoidable, as feather-edged cavities would occur; but they could depend upon one fact, and that was, the squarer the edge of their cavity, the more water-tight would be their plug.

Packing amalgam with burnishers, not only with the Bonwill amalgam, but also in the standard alloy, was not satisfactory; they could only get water-tight fillings more or less, but no dependence could be placed upon them.

He also tried putting into the plastic amalgam pieces of amalgam which had previously become set, so as to lessen the shrinkage of the setting mass. He had also tried using a piece of amalgam (previously set) shaped to fit the cavity, and then carefully packed all round in a very solid manner. All the various experiments he had adop-

ted, as far as Mr. Baldwin and himself had experimented, they were led to the conclusion that Bonwill's method was the best, namely, to put the material in, in a very plastic condition, pack it with heavy pressure, and remove the soft portions as they came out of the cavity.

Mr. Tomes, in conclusion, said that his experiments had not been numerous enough or sufficiently widely extended to prove anything, and must be simply regarded as suggestions.

They wanted to use a good plastic amalgam in large molar crown cavities, and it would be a good thing if they could find out the best method of manipulating it. Dr. Bonwill's method of packing amalgam was described as follows by Mr. Ewbank in the *Journal of the British Dental Association*.—

"I wish to communicate to the profession a rapid, easy and effective method of plugging teeth with amalgam, kindly shown to me by its originator, Mr. Bonwill, of Philadelphia; and as this way is particularly suitable for contour work, I will describe the filling of two interstitial cavities, taking for example the proximal surfaces of a first and second molar. The teeth having been previously separated, the cavities are excavated, the cervical margins, when practicable, being cut down to the level of the gum, and the lingual and labial walls largely removed, so that the edges of the fillings may be well exposed. Small grooves are then cut on either side, and, as a rule, retaining cavities made on the masticating surfaces. The amalgam (Dr. Bonwill's amalgam for fixing his crowns) is now mixed with sufficient mercury to make a firm though plastic mass, and, the cavities having been dried, a small portion of the mix is placed in and between the cavities, and worked in first with a burnisher, and then pressed home by placing on it pellet of bibulous paper, and applying to the pellet very considerable pressure with a blunt-pointed steel instrument. More amalgam is inserted and condensed in the same way, and the process repeated until the cavities are complete

filled, when, finally, great pressure is applied through a pellet of paper, by means of an instrument devised by Dr. Bonwill for fixing his artificial crowns (bicuspid and molars), which consists of an india-rubber buffer about half an inch in diameter, slightly projecting from a ferrule fixed to a wooden handle, the surface of the rubber and ferrule being at an angle of about forty-five degrees to the axis of the handle, to allow of its being applied to the back teeth. The fillings, or rather the filling—for at this stage there is only one—is now cut away until the bite is free (this being done first to prevent any chance of the amalgam being dislodged), and then roughly shaped at the cervical margin with thin steel instruments, but not divided at the surface, and the operation is completed for that sitting. On a subsequent day, when the amalgam has completely set, a division is made with a very thin band-saw, and the fillings shaped with hard rubber and corundum discs at the sides, and with conical fissure burrs at the cervical margins, and finally finished by polishing with pumice powder, &c.

“The principal peculiarities of this method are, filling proximal cavities together, by which much time is saved, and using considerable pressure on pellets of bibulous paper, by which process the amalgam is thoroughly adapted to the walls of the cavities, while all excess of mercury is squeezed out at the sides, and the crumbling—so common a source of trouble when using very dry amalgam—avoided.

“Dr. Bonwill frequently separates teeth by means of a temporary filling of red base plate, placed in and between the cavities, which, being bitten on, spreads laterally, and in the course of a month or so makes the requisite space.”

Upon that method they had not further advanced in the making of water-tight amalgam fillings.

DISCUSSION.

Dr. Elliott had heard some two years ago from Dr. Bonwill respecting his method of filling cavities with amalgam, and had filled cavities in that way with more or less

success; but he certainly had not found the method to be superior to the old, as Mr. Tomes had done, from his experiments. He did not, however, consider that stoppings in patients' mouths could practically prove very much, as the conditions of each mouth varied so very much that it was impossible to get reliable information in that way.

Mr. Oakley Coles had only recently examined some specimens of amalgam sent out by Fletcher, of Warrington, some years ago, in glass tubes with Draper's ink underneath.

He had discovered that no leakage through had occurred, but the ink had penetrated the amalgam plug, clearly showing shrinking of the filling, to the extent of about two-thirds its depth. He considered a cylindrical form of cavity to be undoubtedly the best, and less liable to shrinkage than one which was shaped with a bevelled margin.

Mr. F. Canton said that gutta-percha fillings were not water-tight, and yet prevented decay. Was it necessary to have an amalgam filling water-tight to be a good one.

Mr. Stocken had always used his amalgams as dry as possible, so as to ensure a plastic stopping when finished. He thought that, by the Bonwill method of filling, the mercury squeezed out would carry with it some of the constituents of the amalgam.

Mr. S. Bennett said that Dr. Herbst had sent, early in the year, some specimens of amalgam plugs filled with rotary burnishers. Dr. Herbst laid down the rule that in preparing the cavities for his method of gold filling or for amalgam there must not be a chamfered edge of any description.

Dr. Field had not made any practical experiments with amalgams out of the mouth. He invariably used the rubber dam when putting in an amalgam filling, as he considered that better results could be obtained in that way.

Mr. W. H. Coffin was inclined to think very highly of the Bonwill method, for his very sufficient reason that his father had filled amalgam in the same way for the last ~~fifty~~ ^{fifty} years.

or twenty years. Dr. Bonwill had undoubtedly introduced the method quite independently, and deserved every praise for bringing it before the profession.

Mr. Hutchinson, Mr. Wilson, and Mr. B. Mason joined in the discussion.

Mr. Tomes having briefly replied, the President called upon Dr. Field for his paper on "Pivot Crowns."

Dr. Field said the few remarks he intended to make had been suggested by what had been said at the previous meeting with reference to the durability of teeth pivoted by the old method. He had nothing new or original to bring forward on this subject, but he wished to offer one or two arguments in favor of a more modern or more elaborate method of attaching porcelain crowns to roots. He could bear witness to the durability of teeth pivoted by the old method, but he believed that at the present day dentists had to deal with very different conditions, and that their methods of practice must be modified accordingly. In the first place the quality of teeth which the practitioner of the present day had to work upon was not so good as that which fell to the lot of their seniors. In the second place it must be remembered that in former days it was rare that any but a sound root was pivoted, and that many teeth which would now be saved would then have been extracted without hesitation. The apparent success of the old method was not due to the means employed, but rather in spite of them, just as similar teeth were saved by gold and amalgam fillings inserted in a manner which would not be considered creditable at the present day.

It was with the inferior quality of teeth and under the less favorable conditions with which practitioners were now expected to deal, that he claimed superiority to the method he was about to describe, and which had been first introduced by the late Dr. Marshall Webb.

Supposing the root to be in a healthy condition, the first steps were to enlarge the canal to as near the apex as was prudent, close the apex, grind the end of the root level

with the gum, and polish its marginal surfaces. A suitable crown must then be chosen, fitted to the root, and backed with thin gold. The pivot should be either square or triangular gold or platinum wire, sufficiently long to extend to the end of the canal when soldered to the backing. Next place the tooth and pivot *in situ*, fasten them together with wax, remove the whole carefully from the mouth, enclose in plaster, and solder the pivot to the backing. Then by means of corundum or emery discs, cut a groove on both sides of the porcelain and across the cutting edge above the backing; into this the cohesive gold must be carefully packed. Having prepared the crown, adjust the rubber dam, fix the pivot in the root by means of a good quick-setting oxychloride cement, leaving a space of one or two lines between the porcelain face and the root. When the osteo is sufficiently hard, remove enough from around the pivot to obtain a firm foundation for the cohesive gold, then proceed to build up the contour of the tooth into the grooves already mentioned. When completed, finish with great care, giving special attention to the margins, this being the weakest point in all operations upon the teeth.

He had not gone into all the details of this method, but he thought the description he had given would enable anyone who chose to exercise his manipulative skill to fix such a tooth properly.

The advantages of the Morrison crown over a pivot tooth were, first, the ease with which they could be fitted to bicuspid and molar teeth; second, the firm support given to the root by the closely fitting band and the great strength of the whole combination; thirdly, they may be used on roots which would be condemned as useless for ordinary pivoting. The root should be prepared by cutting down to the gum, and removing with a fissure burr any inequalities of the periphery and all the enamel edges. A strip of 22-carat gold as wide as the length of the proposed crown is then fitted as accurately as possible to the root. The cap or cusps should then be struck up, fitted and soldered

to the band, the depressions inside the cap having been previously filled up with solder. The root canals should be prepared as for the Webb pivot, and the wires fixed in the canals with cement in the same way; these should extend as far above the root as possible without coming in contact with the crown. The gum having been pressed from the root and the parts kept thoroughly dry, the crown is filled with cement, placed on the root and driven home with a few taps of the mallet; a small hole should first be drilled in one of the cusps through which the surplus cement may escape. Dr. Field then handed round one of the crowns, and also the steel dies from which they were made.

After some discussion, the meeting adjourned till November 2nd.—*The Dental Record*.

ARTICLE IV.

DENTAL HYGIENE.

BY G. L. CURTIS, D. D. S.

(Read at a Union Meeting of the Fifth and-Sixth District Dental Societies.)

As is well known, a judiciously applied stopping will arrest decay and save a tooth for years of usefulness to its owner, but a course of treatment that will effectually prevent the first appearance of decay is as yet almost unknown, or at least unheeded, in our profession.

Constitution, health, nutrition, or habits of living, all bear so directly upon the teeth and their construction, that in this age of so-called civilization, with its artificial means of living, the dental organs have degenerated, until they seem almost beyond the reach of remedial agents. Local treatment, however, and constant care in daily life, will accomplish much.

Cleanliness, which is indispensable, and is certainly the most important remedy in preventing disintegration of the teeth, stands first, and the dentist cannot too earnestly impress upon the minds of his patients the importance of this great fact. Neglect this, and the advantages of good inheritance, natural strength, and the most skillful treatment, are all jeopardized.

The dentist should strongly urge the use of the brush after each meal, and before retiring, teaching the patient how to use it so as to get the upward and downward motion that enables the bristles to pass between the teeth and remove all deposits of food and calcareous deposits, and at the same time polish the approximating surfaces, instead of the lateral motion more commonly practiced, in which the labial surfaces only can be reached. Many would be benefited by having a proper brush selected for them, and should be instructed as to what dentifrice is not injurious.

The importance of the use of the quill pick, and of the floss silk, are second only to that of the brush, and for the purpose for which it is used the common quill pick is the best. The significance of all this, and the great importance of keeping the teeth clean, should be impressed upon the minds of children as well as of adults, and with all the earnestness possible. With ænemic and delicate persons it is often necessary to resort to general treatment. In prescribing medicine, which by direct contact would be injurious to the teeth, due care should be exercised, as we too often see the effect resulting from neglect in this particular, on the part of physicians. Alkaline washes are very beneficial in systems where the saliva is rendered acid in its reaction, and should be freely used. Our attention is often called to one or more teeth which yield readily to the secretions of the mouth, and become so sensitive that pain is produced whenever an attempt is made to brush them. In such cases lime water, bicarbonate of soda, or precipitated chalk, is useful. The latter should be placed around the teeth on retiring, and allowed to remain till morning.

To strike at the root of our subject, education is first essential, and every mother should be cognizant of the necessity of giving herself the proper care during gestation, and of taking the requisite amount of exercise and suitable food to develop the bone tissue of her child. This, too, is particularly important during the period of lactation, and the development of the permanent teeth.

In conclusion, we believe it is to the children and their teeth that we should direct our chief attention, and that in the carrying out of the best treatment known to us, together with what suggestions we may be able to get from those around us, lies our greatest success.—*Independent Practitioner.*

EDITORIAL, ETC.

THE REASON WHY THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MARYLAND DEEMS IT INEXPEDIENT TO JOIN THE NATIONAL ASSOCIATION OF DENTAL FACULTIES, IS SET FORTH IN THE FOLLOWING LETTER:

University of Maryland, Faculty of Physic, Department of Dental Surgery.

BALTIMORE, July 28th, 1885.

To the National Association of Dental Faculties.

GENTLEMEN:

The faculty of the University of Maryland, Dental Department, desire to acknowledge the receipt of the "Transactions of the National Association of Dental Faculties," and also the notice of the meeting to be held in Chicago, July 31, 1885, with Article VII. of the constitution.

I am directed by the Faculty of the University of Maryland, Dental Department, to inform your Association, that they

will careerfully comply with all the requirements relating to the graduation of students in dentistry, as adopted at the meetings held in New York City and Saratoga in August, 1884, so far as refer to two full courses of five months each in separate years, etc., and have published the same in our Annual Catalogue of 1885, copies of which have been mailed to the President and Secretary of your Association. At the same time, however, the Faculty of the University of Maryland, Dental Department, deem it inexpedient to join the National Association of Dental Faculties, for the reason that they believe the present curriculum of study, etc, in the University of Maryland, to be superior to any graded course of study, such as is obligatory upon all dental schools joining your Association, for the reason that the graded course restricts junior students to dental mechanism alone for the one session of the two comprising the full course to the exclusion of operative dentistry, and, therefore, affords dental students the advantage of but one session in the acquirement of a knowledge of a branch of our science for which the time of two entire sessions is not too long.

The Faculty of the University of Maryland, Dental Department, contend that students in dental schools should have all the advantages possible of the two sessions in operative as well as in mechanical dentistry, and that the adoption of such a graded course as that required by your Association, and which restricts the dental student in the manner referred to, must be *retrogressive* instead of progressive in dental education.

Respectfully, &c.

F. J. S. GORGAS.

Dean of University of Maryland, Dental Department

MONTHLY SUMMARY.

"DEATH FROM INHALING NITROUS OXIDE."—Dr. A. J. Shurtleff, a dentist practising in Naitch, Mass., and having an office also in Boston, at the Hotel Roylston, was found dead in his Boston office on the evening of February 26th, under circumstances which show that his death was caused by inhaling that form of nitrous oxide known as "Mayo's Vegetable Anæsthetic," which we have been informed is simply nitrous oxide that has been washed through some solution of vegetable compounds.

The janitor of the building upon being informed by the night watchman that Dr. S. had not gone out of his office, at about 10 o'clock p. m. entered the room and found the doctor lying upon the floor dead. The gas cylinder was lying upon the floor close by his head, completely empty of gas; the tube, detached from the inhaler, was held in the left hand; with one end of it held tightly between the teeth, the other of course attached to the cylinder. The right hand held the wheel wrench, close to, but disconnected from the cylinder. The face of the deceased was very much discolored, but the body was not cold. The physician summoned expressed the opinion that life had been extinct for about an hour. The last time the doctor was seen alive was about 6 o'clock, when the janitor opened the office door and found a gentleman friend with him. That friend says that about 5 o'clock he, at the doctor's request, gave him a little gas, the doctor telling him how to do it. This friend went away soon after 6 o'clock and left the doctor, as he says, all right. It is not supposed that it was a case of suicide, as there is no known reason for such a theory. The doctor had been complaining of a tooth-ache during the day, but it is not probable he took gas for that reason. Once, weeks before, the janitor

had entered the office and found the doctor in his operating chair and in the act of giving himself gas. As the doctor was at times addicted to the too free use of spirituous liquors, the more probable theory is that he took gas when not in just the condition of mind to judge rightly in regard to it, and died as the result of carelessness on his own part in taking the gas for the pleasurable sensation it gave him. When found by the janitor in the act of giving himself gas he was slightly under the influence of something besides gas, and there is every reason to believe he had "been taking something previous" to the fatal attempt to administer gas to himself. No dentist should ever undertake to administer an anæsthetic to himself under any circumstances. The writer once found a Dental student in an anæsthetized condition with the inhaler still in his mouth and the gas turned on, and in all probability in a few minutes more death would have been the result of that student's experiment with gas "to see what it was like." There are many cases on record of persons dying from the attempt to put themselves to sleep with chloroform. Dr. Shurtleff was about 40 years old, and had been in practice nearly 20 years, and was considered a good and successful practitioner.—*Archives of Dentistry*.

SOME MODIFICATIONS OF THE ANTISEPTIC METHOD.—

The *Annals of Surgery* for July contains the following abstract of Prof. Mikulicz' report of his last three year's work at Cracow. In practice solutions of bi-chloride are used at least ten times the strength which experiment has seemed to indicate as sufficient. Koch, however, pointed out that the weaker solutions were adequate only where all the disinfectant in solution could exert its full action, and that in the case of sublimate other strengths would have to be used for disinfection of fluids rich in albuminates and sulphur, or other compounds forming insoluble combinations with mercury. In wounds, the formation of albuminate of mercury immediately weakens the solution, so that it may be reduced from one of the strongest to a very moderate antiseptic.

For the prophylactic portion of wound-antisepsis—disinfection of sponges, tubes, sutures, operator's hands and part

to be operated—such objection does not hold. Sublimate is incomparable, its value being increased by the rapidity of its action. It is not suitable for metal instruments, since they are attacked by it. During and after completion of an operation, on the other hand, we have to deal with albuminous secretions, a very varying factor. Experience, rather than experiments, must guide us here. Koch laid down the rule that the disinfecting solution should contain sufficient bichloride, that 1 part in 5,000 remain free. K. found that river water required 1:2000, bilge-water 1:1000, and putrid blood 1:400. Mikulicz experimented with defibrinated ox-blood and spring-water. Sublimate 1:1000 retarded and diminished the development of micro-organisms; weaker solutions not perceptibly; while only a strength of 1:400-500 completely prevented their appearing. Comparative tests showed that it only needed about double this strength of carbolic to give as good results. Schill & Fischer found that 1-5 of sublimate solution, mixed with an equal volume of tuberculous sputum, quite failed to disinfect it, while a 5 per cent. carbolic sufficed. Since the excretion of pathogenic micro-organisms usually occurs in connection with albuminous material, sublimate is probably less trustworthy for such hygienic disinfection than carbolic. His own tests with bichloride simply bore on the question of impeding the development of, rather than destroying germs, since the latter would require too irritating solutions. Mercury albuminate itself is, however, not entirely inactive, and does not readily putrify.

There are, therefore, good reasons for considering carbolic a far more constant and trustworthy wound antiseptic than sublimate, although the latter is the stronger agent. If sublimate is used in preparing for an operation and full precautions be taken, then even pure water (0.6 per cent. salt solution) may answer for wound irrigation (V. Jan. No. p. 88). In septic puerperal conditions, it is questionable whether sublimate should be used since either strong solutions or frequent irrigation may prove toxic. As a wound dressing iodoform, thymol, etc., are not inferior to bichloride, and less dangerous. Again, sublimate, contrary to general impression, is volatile. Kratschmer found that sublimated gauze after being kept 3

months in cans, had lost nearly all its sublimate. Lazarski, at his request, examined this question and found that sublimated gauze left exposed for 20 weeks lost $\frac{1}{2}$ to $\frac{3}{4}$ of its bichloride, and if boxed up for the same period $\frac{1}{4}$.

Finally, sublimate may be absorbed in fatally toxic amount. Its local caustic action—principally seen under sublimate dressings—has repeatedly caused eczema, erythema, urticaria, etc. Constitutional effects have been noted by several observers after such dressing, and after uterine injections. A few cases have ended fatally. M. refers to 6 at least, and gives one of his own, after extirpation of breast and axillary glands, where sublimate was only used in the dressing. It was the first case in which he used bichloride. The saw-dust dressing had been impregnated with 1 per cent. sublimate solution. Individual susceptibility varies.—*Northwestern Lancet*.

CROWN WORK.—By M. W. Williams, Hopkinsville, Ky.
—Profitable and popular crown work must be done in short time, with ease, both to operator and patient, must be durable and artistic. This ideal has as yet not been attained by Howe, Bonwell, Richmond, Logan, or Sheffield, as many will attest. But that I have conquered part of the field, you are only to see to be convinced, by part of the field, I mean to say for incisors and canines can cry "*Eureka*"—I have complied with every condition mentioned above. I will give a short pen sketch, omitting details.

The crown is similar to old fashion wooden pivot crown, except the pivot-hole is lined with platina tube. A similar tube $\frac{1}{4}$ inch long, with bottom and depending shank of platina securely soldered to it designed to be secured in root canal. The lower portion of this tube is slightly larger than orifice. There is solid platina connecting post, in size easily to pass in tubes, in length so that mouths of tubes will meet when in position. The lower $\frac{1}{4}$ inch of post is slitted for reception of key wedge which is a small tapering steel wedge $\frac{1}{4}$ inch long and thickness of No. 1 file at its thickest end.

To adjust it, grind off root on line with gum, enlarge canal, so that tube and its depending shank will drop in loosely be-

yond level with end of root. Grind base of crown to approximate joint with end of root. Solder unslitted end of post in tube of crown, slip tube of root attachment over slitted end, mix agate cement thin, fill canal one-half full, force all in position, have the patient close the mouth, hold steady in articulating position until cement hardens; withdraw crown and post, leaving root attachment in exact position; trim down the cement, fill out with amalgam, allowing it to spread thinly, all over the end of root; insert small key wedge place firm piece of wood on cutting edge of crown, with mallet gently drive it home; the end of the key striking the bottom of the tube will force itself in expanding sides of post to fill the dovetailed space. Thus you can readily see it is impossible for it ever to become loosened or detached. Advantages. Its simplicity, strength and durability; strongest because of the size and shortness of the post, and having more porcelain, strengthen by tub, in crown. The crown being out of the way. The ease of perfectly forcing amalgam round root attachment in canal, and efficiency in which the end of root can be protected from further decay: *It is self-articulating.* No exposure of cement, and but a line of amalgam at the gum margin. It is artistic in that it conceals art; can be permanently secured at one short sitting of thirty minutes without causing your patient any pain, and with the greatest comfort to yourself, knowing it will remain as long as the root stays in the mouth. One other advantage in case of accident to the porcelain, is the great ease with which another crown can be attached.—*Dental Register.*

DISCARD OXYPHOSPHATES.—*By C. A. Landrum, M. D.*
—After about five years' close observation, I have arrived at the conclusion that the oxy-phosphates should be banished from operative dentistry. It will not do to cap exposed nerves, or to fill cavities in such close proximity to the pulp as to require a plastic material. I have carefully watched its action in the above character of cases, both in fillings of my own, and in those that have come to me from other dental practitioners. In the "setting" process, it would seem that sufficient phosphoric acid is set free to slowly but effectually devitalize

the pulp, even though a considerable septum of dentine intervenes. This I suppose to be the action, although I have not as yet resorted to those chemical tests that would demonstrate it. This I do know: teeth exposed to its action, under the above conditions, invariably die after a few months; and they usually die painlessly. I have in many instances used it for this express purpose, where I did not wish to use arsenic. I notice several writers use it as a temporary stopping in sensitive cavities, for the cure of the sensitiveness, and I doubt not it is this very action which gives its application success. Arsenious acid will do the same, even more quickly, but thoughtful dentists would never use the latter agent for this purpose. Phosphoric acid is probably as severe a caustic as arsenic, and if used pure, as we do arsenic, would probably produce devitalization as surely and quickly. But the small amount that exudes from the inner surfaces of fillings is in such a state of dilution as to produce its results slowly. I know that many of the first men in our profession use it for capping nerves, for filling roots, for temporary fillings in sensitive cavities, for filling cavities with frail walls, and often as a lining under gold or amalgam. But I think if they will observe their own and others' work closely, they will come to this conclusion: That oxy-phosphate of zinc should only be used in dead teeth, or those we wish to destroy.—*Southern Dental Journal*.

NEW CAPSICUM PLASTER.—DR. FRANK B. DARBY, of Elmira, N. Y., has recently introduced a "Capsicum Plaster" to take the place of the "Capsicum bag" so successful used during the past year. Dr. Darby's improvement consists in placing the same ingredients as contained in the bag on a soft, flexible rubber-coated felt, of suitable size, forming a "plaster" which readily adapts itself and will stick to the gums and remain in position. Their use is indicated in all cases of pericemental inflammation, and pulp irritation, such as pain or tenderness about the roots of dead teeth, soreness caused by prolonged gold operations, wedging, or other causes. In fact, any tenderness or inflammation about the roots of teeth, is claimed

to be relived by the prompt application of this plaster. Very favorable reports have been received from those who have tried both "bag" and plaster," and in all instances the plaster has been given the preference.

A NARROW ESCAPE.—"Dr. Theodore G. Lewis, the well-known dentist and editor of *The Dental Advertiser*, had a narrow escape in the burning building, and it is a noteworthy coincidence that he was one of the last to leave the *Commercial* building, when it was destroyed by fire in December, 1882. The Doctor thinks he has had his share of fire experiences in printing offices. Last evening he was in the job office of the *Express* on business, and was conversing with the foreman, when there was a sudden rush, and a cry of fire. The Doctor started down the stairway on the Exchange street side, but was driven back by the flames and smoke. He then recollected that a stairway leading to the roof was close at hand, and instead of going down he went up, reaching the roof in perfect safety, and remaining there for about three-quarters of an hour. Had he become confused, or been unfamiliar with the surroundings, he would doubtless have lost his life."—*Commercial Advertiser*.

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ARTICLE I.

AMERICAN MEDICAL ASSOCIATION.

SECTION OF DENTAL AND ORAL SURGERY.

Thirty-Sixth Annual Meeting, held at New Orleans, La., April 28, 1885.

Reported for the Dental Register, by Dr. J. S. Marshall.

The General Meeting of the Association, though not as large as usual, was very interesting and profitable. Something over six hundred members were registered from all parts of the country, but this number would have been doubled had the place of meeting been more centrally located, or the time a month earlier. The weather was very warm and oppressive, which made the attendance upon the various sections somewhat less than it would have been under more favorable circumstances. The profession and citizens of New Orleans however did all in their power to make our stay among them enjoyable.

The local gatherings and receptions were particularly pleasant and were participated in very generally by the members of the Association and their lady friends.

The sessions of the Section on Dental and Oral Surgery were held in Grunewald Hall, each day, commencing at 3:30 P. M.

The section was called to order on Tuesday afternoon by Dr. J. S. Marshall, of Chicago, Ill., who stated that the officers of the section were both absent, Dr. W. W. Allport, Chairman, being detained at home through illness, and Dr. E. C. Briggs, the Secretary, by professional engagements. It would therefore be necessary to elect a Chairman and Secretary. On motion of Dr. A. E. Baldwin, of Chicago, Dr. Jacob S. Williams, of Boston, Mass., was unanimously chosen Chairman, pro tem.

Dr. Williams on taking the chair stated that the absence of the Secretary was entirely unavoidable. On motion of Geo. H. Fredericks, of New Orleans, Dr. John S. Marshall, of Chicago, was elected Secretary pro tem. The minutes of the last session of the section having already been published in the *Journal* of the Association the reading of them was dispensed with.

On motion of Dr. A. E. Baldwin, the privileges of the floor were extended to those gentleman present and practitioners of dental surgery who were not members of the Association.

Dr. John S. Marshall, of Chicago, Ill., then read a paper entitled:

COCAINE IN DENTAL SURGERY.

The following is an abstract of the paper:

MR. CHAIRMAN AND GENTLEMEN:—The hydrochlorate of cocaine, like all new remedies which have given promise of mitigating the sufferings of mankind, was hailed with enthusiasm, and it is fast gaining a firm foothold in certain lines of practice as a local anesthetic, notably in operations upon the eye and upon mucous and serous tissues.

On the other hand, with the dental surgeons hydrochlorate of cocaine has lost much of its interest from the fact that it has proved a disappointment where it was hoped

that it would be of the greatest benefit, viz., as an anesthetic or obtunder of sensitive dentine; and now that the enthusiasm over the drug has waned and we begin to investigate its claims with cooler heads and less biased judgment, many of the published accounts of its wonderful effects upon sensitive dentine, and other tissues of the teeth, it would seem must have originated very largely in the imaginations of the writers rather than that they were clinical facts. New forms of the drug, however, have been more recently introduced which give promise of better results, and my excuse for presenting a paper upon the subject of cocaine is to call your attention especially to the citrate of cocaine by presenting a series of experiments made with the hydrochlorate, the oleate, and citrate, and then leave you to judge which gives promise of being the most reliable local anesthetic or obtunder of sensitive dentine.

In operations upon the mucous membrane of the mouth there seems to be little choice between any of these forms, but upon sensitive dentine and pulp tissue it will be seen by the following experimental cases that the citrate is much more reliable than either of the others.

The cases selected were the first ten upon which each of these forms of cocaine were tried. *Hydrochlorate or muriate of cocaine*— $C_{17}H_{21}NO_4HCl$ — With this form of cocaine I first used a 2 per cent. solution prepared by Foucar, but after several trials, more or less failures, I came to the conclusion that a dense tissue like dentine absorbs so slowly that a sufficient quantity of 2 per cent. solution could not be taken up to produce anesthesia, and therefore procured 10 per cent. and 20 per cent. solutions prepared by Merck, but was unable to obtain any better results with these than with the 2 per cent. A 40 per cent. solution has been recommended; this I have not tried, but from the experience of others who have experimented with it, it seems to have no advantage over the weaker solutions.

In cases Nos. 1 and 2 the rubber dam was not applied, and in case No. 4 of course there was no use for it; in all

EXPERIMENTS WITH THE HYDROCHLORATE OF COCAINE—SUMMARY OF CASES.

Case.....	Age.....	Structure of the Teeth.	Diseased Condition	Local Anesthetic.	Strength of So- lution, per ct.	Number of Ap- plications.	Immediate Ef- fect.....	Time, Minutes.	Results.	Remarks.
1	30	Soft.	Sensitive Dentine.	Foucar's Sol.	2	2	None	10	Sensitiveness greatly relieved.	
2	15	Soft.	Sensitive dentine.	"	2	4	None	20	No anesthetic effect	
3	24	Medium.	Sensitive dentine.	"	2	3	None	15	No anesthetic effect.	
4	24	.....	Pyorrhea alveolaris.	"	2	3	None	10	Operated with little pain. Gums com- pletely anesthetized.	A previous operation without the Co- caine had been very painful.
5	50	.....	Inflamed pulp.	Merck's Sol.	10	4	None	20	No anesthetic effect.	Applied for extirpation.
6	26	Medium.	Sensitive dentine.	"	10	3	None	15	Slight anesthetic ef- fect.	
7	28	Dense.	Sensitive dentine.	"	10	3	None	15	No anesthetic effect.	Drying the cavity with hot air seemed to produce a slight anesthetic effect.
8	14	Very Soft.	Sensitive dentine.	"	20	3	None	15	Slight anesthetic effect.	Drying the cavity with hot air seemed to increase the anesthetic effect.
9	16	Medium.	Sensitive dentine.	"	20	3	None	15	Slight anesthetic effect.	Drying the cavity with hot air seemed to increase the anesthetic effect.
10	24	Medium. •	Sensitive dentine.	"	20	4	None	20	No anesthetic effect.	

EXPERIMENTS WITH THE OLEATE OF COCAINE—SUMMARY OF CASES.

Case	Structure of the Teeth.	Diseased condition.	Local Anesthetic. McKeesson & Robbins.	Strength of Oleate, per cent.	Number of Applications.	Immediate Effect.	Time, Minutes.	Results.	Remarks.
1 12	.....	Abcessed root.	Oleate.	5	3	None	12	Pain on extraction.	Gum anesthetic in 8 minutes.
2 40	.....	Abcessed root.	"	5	3	None	20	Pain on extraction.	Gum anesthetic in 7 minutes.
3 60	Dense.	Inflamed pulp.	"	5	3	None	30	No anesthetic effect.	Applied normal oleate for 15 minutes, with no effect. Application made for extirpation.
4 30	Medium.	Sensitive dentine.	"	5	3	Slight pain	25	No anesthetic effect.	
5 25	Soft.	Sensitive dentine.	"	5	1	None	30	No anesthetic effect.	Applied normal oleate for 15 minutes, with no effect.
6 11	Soft.	Sensitive dentine.	"	5	3	None	20	No anesthetic effect.	The hot air blast produced slight obtunding effect.
7 14	Medium.	Sensitive dentine.	"	5	3	None	20	Slight anesthetic effect.	
8 40	.....	.....	"	5	3	None	30	Gum lost sensation in 15 min. Root and border of alveolus quite sensitive.	Application made preparatory to fitting a gold band to the root of a central incisor sup.
9 35	.....	Pyorrhea alveolaria.	"	5	2	None	15	Operated with little pain.	
10 43	Dense.	Sensitive dentine.	"	5	3	None	20	Slight anesthetic effect.	

EXPERIMENTS WITH THE CITRATE OF COCAINE—SUMMARY OF CASES.

Case.	Age	Structure of the Teeth.	Diseased Condition	Local anesthetic.	Amount of Citrate used, gr.	Number of Applications.	Immediate Effect.	Time, Minutes.	Results.	Remarks.
1 26		Soft.	Sensitive dentine.	Citrate.	1-16	1	Slight pain.	10	Complete anesthesia.	Lasted about one hour.
2 19		Medium.	Sensitive dentine.	"	3-16	2	Slight pain 6 min.	15	Complete anesthesia.	
3 35		Soft.	Sensitive dentine.	"	5-16	3	Severe pain 30 min.	30	Partial anesthesia.	Operation quite painful.
4 20		Medium.	Sensitive dentine.	"	1-16	1	Slight pain 3 min.	10	Complete anesthesia.	
5 30		Sensitive dentine. Inflamed pulp.	"	2-16	1	None.	15	Complete anesthesia.	Extirpated the pulp without pain.
6 16		Soft.	Od'algia	"	7-16	3	Patient suf. before citrate was applied.	30	No effect.	Patient relieved in 5 min. by the application of oil of cloves & sulp. morph. $\frac{1}{4}$ gr.
7 18		Soft.	Sensitive dentine.	"	2-16	2	Slight pain 5 min.	15	Complete anesthesia.	
8 24		Dense.	Sensitive dentine.	"	1-16	1	Slight pain 3 min.	10	Complete anesthesia.	
9 23		Soft.	Sensitive dentine.	"	2-16	2	Slight pain 5 min.	30	Partial anesthesia.	Operation slightly painful.
10 27		Dense.	Sensitive dentine.	"	1-16	1	Slight pain 3 min.	10	Complete anesthesia.	

others, after syringing the tooth with tepid water and removing all loose debris, the dam was adjusted, the cavity dried and the cocaine solution applied by a means of a pledget of cotton.

Oleate of Cocaine.— $C_{17}H_{21}NO_4$ $C_{18}H_{33}O_2$.

Normal oleate of cocaine contains from 48 per cent. to 52 per cent. alkaloid cocaine. Messrs. McKesson and Robbins kindly furnished me with samples of the normal and 5 per cent. oleates manufactured by them for this series of experiments.

In all cases of sensitive dentine, and the one with an exposed pulp, the rubber dam was adjusted and the cavity cleansed and dried, and the oleate applied on a pledget of cotton.

In the others the gums were dried and the oleate painted over the surface and the parts kept free from moisture during the operation by the use of napkins.

Citrate of Cocaine.— $(C_{17}H_{21}NO_4)_2H_3C_6H_5O_7$. This form of cocaine was first manufactured and recommended by Merck of Darmstadt, as likely to prove most satisfactory as an anesthetic for sensitive dentine.

My attention was first called to it by a letter in the *Journal* written from Weisbaden, December 4, 1884, by Dr. Sarah Hackett Stevenson.

I at once took steps to procure a sample of Merck's preparation, but, failing in this, Messrs. McKesson and Robbins kindly prepared a sample for me and this I had made into pills of one-fourth grain each.

The excipient used was gum tragacanth dissolved in glycerine. This readily dissolves on being moistened with tepid water and therefore makes a very convenient vehicle for the introduction of the citrate into the cavity. My method of using it is as follows: Remove all loose debris from the cavity, and wash it out with tepid water, then adjust the rubber dam, divide a pill into two or four equal parts and place one of these in the bottom of the cavity and cover it with a pledget of cotton moistened with tepid water.

The excipient soon dissolves and flows over the surface of the cavity. I five minutes I test the dentine and if still sensitive make a second or third application if necessary.

Since recording the above cases I have had still further opportunity of testing the merits of the citrate of cocaine. In several of the cases of sensitive dentine where the hydrochlorate and the oleate failed I have since used the citrate with much better results.

From the cases recorded it will be noticed that the citrate is much more reliable as an anesthetic or obtunder of sensitive dentine than either the hydrochlorate or the oleate. Whether this is due to the special form of the drug or its greater concentration as used in the cavity I am unable to say.

It also seems to act much more promptly whether applied to sensitive dentine, pulp tissue, or mucous membrane.

Dr. Geo. H. Friedrichs, New Orleans. My son and I have used the hydrochlorate of cocaine in dental operations, but with no success.

The citrate we have not tried, because we have been unable to procure it.

From the report of the cases in which Dr. Marshall has used the drug, it seems to be much superior to the hydrochlorate.

The pain he speaks of as being caused by the application of the citrate to sensitive dentine, is caused, no doubt, by the abstraction of the fluids contained in the tubuli; and by this process the obtunding effect may be produced, just as it is by the use of the hot air blast, absolute alcohol, etc.

Dr. J. R. Walker, New Orleans. My experience with cocaine has been entirely with the four per cent. solution of the hydrochlorate, and it has not been very successful. I believe the general opinion of the profession to be that the hydrochlorate of cocaine is of little benefit in dental operations.

I have, however, succeeded in anæsthetizing one pulp

and removing it with but little pain, and have extracted one tooth after applying the solution to the gums with a material decrease in the amount of pain usually suffered under such an operation. It has been recommended that if the solution were injected hypodermically into the gums, or in the region of the nerve trunk, that teeth might be extracted under its influence without pain.

Dr. Smith, Honolulu, Sandwich Islands. I have been practicing many years as a dentist and have been hoping that some remedy might be introduced that would be serviceable, and at the same time safe for the relief of the suffering often experienced by our patients while operating upon their teeth.

I have been delighted with the paper of Dr. Marshall upon cocaine.

I have not had an opportunity to test the merits of the drug, as I have for the present given up my profession, but from the cases reported by Dr. Marshall I should expect good results from it.

The essayist remarked that he finally devitalized with arsenic one of the pulps which he tried to anæsthetize with the hydrochlorate of cocaine.

The amount used (60 to 100 parts of a grain) is very small and could do no harm, but as generally used I have seen very bad results from it, and I always hesitate to apply it.

Dr. A. E. Baldwin, Chicago. I have had no experience with any other form of cocaine than the hydrochlorate, and my experience has been very much the same as that described in the cases reported by Dr. Marshall and the gentlemen who have just spoken. One experience I have had with cocaine which I will relate. In excavating a cavity under hydrochlorate, and failing to get the anæsthetic effect, yet feeling that something must be done to quiet the patient, I applied to the gum over the apex of the root a pellet of cotton saturated with sulphuric ether, and to my great astonishment I was able to finish the preparation of

the cavity without pain. I have tried it upon cases since with as good results. With regard to arsenic I should say that the 100th part of a grain would be just as effective as a whole grain. All we want is the irritant effect, and that can be gained just as well with a small dose as with a large one. I am in the habit of applying dialized iron to the gum after the arsenic is in place as a precautionary measure in those cases where I find it necessary to resort to the use of arsenic for devitalization of the pulp. Referring again to the use of cocaine, I think the variability in the effect of the drug is due more to the result of the condition of the tooth and to the methods of applying it, than to any change in the drug itself. I should have been very glad if Dr. Marshall had described more minutely the extent of the caries, and pathological conditions of the cases upon which he experimented. It will be well for us to do this in our experiments with the drug.

Dr. Friedrichs. I think the ground just taken by the last speaker is entirely untenable. Cocaine is supposed to be a local anæsthetic. The pulp is not a nerve proper, neither are the nerve fibres of the dentine, they contain nothing but neuralemma; therefore the depth or extent of the caries would have no weight.

The shallow cavity is usually the most sensitive. Healthy pulps are not sensitive. This I had opportunity to demonstrate on one occasion when a boy was brought to me within a short time after receiving an injury which had split open a central incisor tooth, leaving the pulp fully exposed; this I could touch with a probe without causing the least pain.

Cocaine used at different times in the same case, does not always give the same results. In some individuals it has proved a success at one sitting, while at another it has been a failure.

Dr. Baldwin. The ideas advanced were not intended to be taken as facts, but simply as an opinion. I am surprised, however, to learn that a normal pulp is not sensitive.

When we excavate a cavity having a living pulp, the dentine is sensitive. Where does the dentine get its sensation, if not from the pulp? The pain must be transmitted by the pulp to the nerve centers, and if this is so the pulp must be sensitive. On mucous membrane cocaine must act by paralyzing the nerve fibres.

Dr. Walker. In all my experience I have never found any such condition of the pulp as described by Dr. Friedrichs. The pulps that I have seen exposed by traumatic lesions have always been sensitive. The sensitiveness is exhausted in certain pathological conditions and under various forms of irritation.

Dr. Marshall. In the case spoken of by Dr. Friedrichs it is not at all improbable that the pulp was paralyzed or rendered anæsthetic by the force of the blow, or its nerve fibres may have been ruptured at the apex of the root.

Dr. Thurber, New Orleans. I did not arrive early enough to hear the paper read by Dr. Marshall, and therefore cannot speak upon that. My experience is however very different from that of Dr. Friedrichs and others in the use of cocaine. I have used the hydrochlorate a good deal in operating upon the teeth of children and have been very much pleased with the results. I am in the habit of using the rubber dam to prevent the ingress of moisture and the consequent dilution of the solution. If all would use the rubber dam I think there would be less failures with the hydrochlorate of cocaine. I have been unsuccessful in extracting teeth by injecting the gums with the solution, but in extirpating pulps I have had better success. I consider cocaine a very valuable remedy as an obtunder of sensitive dentine and I should not be willing to do without it.

Dr. Williams. My experience with the hydrochlorate of cocaine has been like that of the majority of those who have discussed the paper. I have, however, seen the same failures in other remedies. Tannic acid, sulph. ether, aqua calcis, chloride of calcium, etc., in certain cases each of these will obtund the sensitiveness of dentine, but the failures

occur more often than the successes.

With regard to the statement of Dr. Friedrichs that the normal pulp is not sensitive, I am sorry to say that my experience does not agree with his. I once had occasion to open into a pulp which had not been previously irritated, but the tooth was slightly decayed, in this case I found the pulp quite sensitive.

Dr. Friedrichs. In the case just spoken of by Dr. Williams there was a lesion in the tooth, and consequently the pulp must have been to a greater or less extent in a pathological condition, while in my case there was no lesion of the tooth before the injury was received, and consequently the pulp was in a normal condition. The two cases are not alike in any particular.

Dr. Marshall closed the discussion by saying that he had used the hydrochlorate both with and without the exclusion of moisture from the cavity, but could see no difference in the effect. The successes and failures mentioned by Dr. Friedrichs, in his use of the hydrochlorate, as occurring in the same individual at different sittings, must have been the result of the decomposition of the solution.

For the benefit of those who would like to procure the citrate of cocaine for trial, I would say that McKesson & Robbins are now prepared to furnish the profession with the drug in one-eighth gram pills prepared at my suggestion. The price I cannot name, but that which I have been using cost from 80 cents to \$1 per gram. It may be somewhat cheaper now.

Dr. Jacob L. Williams, of Boston, then read a paper entitled, "A Suggestion on the Proper Alternation of Rest with Effort, as Essential to Health and Strength.

ABSTRACT.

MR. CHAIRMAN AND GENTLEMAN:

In my early pupilage I once received a very valuable suggestion from the venerable Dr. John C. Warren, long since deceased, to the effect, "When engaged in a long sur-

gical operation of half an hour or more in duration, the eyes will sometimes become fatigued, and it will be difficult and unsafe to continue the operation with them in that condition. It is better under such circumstances to raise the eyes and let them rest on some object in a distant part of the room, or if you can do so leave the operation, step to the window and look out for a minute or two; you will then return with the eyes refreshed and you can see as well as ever."

More recently one of America's greatest ophthalmologists has written that one great cause of injury to vision is the continuous application of the eyes to study or work after they have become fatigued.

I refer to these opinions because they represent principles which hold good in the exercise of any faculty.

There is a common notion abroad that mere "exercise strengthens," and the other elements necessary to produce strength are lost sight of. Some seem to think that the longer and more vigorously they can exercise their faculties, the stronger they must be; as a result of this we see fatigue carried to exhaustion, and this is only another name for weakening or debility. Illustrations of this are common in all occupations and in all times of life.

Youth is often crowded with continuous study during the day, and many time it is carried into the night; as a result the mental powers become debilitated, sometimes permanently so.

The business or the professional man will not or cannot pause for rest, until he finds that his health has failed, and sometimes not even then, but drops at his post. The ambitious rower or pedestrian continues his efforts sometimes until his strength is gone or his constitution completely shattered. In our special department of practice, many labor too many hours continuously during the day, and perhaps add to this, extra work in the evening, till the nerves shake like so much loose cordage in the wind; and if the individual does not fall dead at his chair, as to my

knowledge occurred in one instance at least, he finds a long period of rest needed to bring back a semblance of his former strength.

The essayist also called attention to the fact that we should not permit or subject our patients to the endurance of continuous suffering; such strain often requiring several days to recover from, and has sometimes been productive of serious results. He placed emphasis upon the term *continuous effort*, because from this comes the harm when carried beyond simple fatigue. Fatigue should never be carried to the point of exhaustion. This rule should be learned early in our professional life, viz., rest if possible, just when you are tired and let your patients do the same.

On account of the lateness of the hour the discussion of the paper of Dr. Williams was deferred till the Wednesday session.

On motion the session then adjourned.

WEDNESDAY'S SESSION.

The session was called to order by the chairman pro tem, Dr. Jacob L. Williams, of Boston, and at once took up the discussion of the paper read by Dr. Williams.

Dr. Walker. The advice given in the paper is very much needed by that part of the profession who practice dental surgery, but it is very difficult to heed. As a class we overtax our strength, and those who have a full practice break down early.

There are two classes of gentlemen whom these suggestions in the paper should warn, viz., those who from ambition to make money will not take the needed rest, and those who from force of circumstances think they cannot do so. These gentlemen are making a grave mistake, which sooner or later they will be forced by failure of health to acknowledge. This has been my own condition twice in my professional life, but I believe I have now learned wisdom. Without good health we cannot perform our best services, and consequently it is a duty to ourselves and to

our patients to preserve the health which has been given us.

Dr. Baldwin. The subject is one that I cannot discuss from the standpoint of the dental surgeon, having so recently entered its ranks, but from my knowledge of the eye and my experience in the practice of medicine I can appreciate the force of the statements and suggestions made in the paper under discussion. I have found also that among the dentists of my acquaintance very many of them complain of the fatigue experienced after the operations. Rest is necessary if we would keep the mind and the body in perfect health. Rest of the eye is just as necessary as rest of the organs of the body after exercise, and if we fail to obey this law of nature, we must sooner or later pay the penalty of an outraged law.

Dr. Marshall. The suggestions in the paper now before us I consider of great value, especially to practitioners of dental surgery.

Those of us who have passed through like experiences with Dr. Walker can appreciate their value, and if those who have not passed through them would heed the advice, so eminently practical they may save themselves untold misery, for what misery is greater than the endurance of the tortures of a shattered nervous system. With regard to the eyes of the majority of dentists in full practice, I think I may safely say vision is not normal; few have perfect eyes. Many, very many, complain not only of the general fatigue after prolonged operations which tax the eye at a short focus, but of headache more or less severe, and this I believe is often caused by the strain put upon the eye at an unnatural focus. In a normal condition of the eye eighteen inches is about the reading distance, but, for various reasons in many dental operations, this had to be considerably shortened, sometimes to eight or ten inches.

Such a strain cannot but fatigue the eyes and sooner or later permanently injure them, and the suggestion to lift the eyes at frequent intervals and allow them to rest upon

distant objects in the room, or out of doors, if heeded, will very materially assist in warding off the conditions that I have mentioned.

In my own case I was a great sufferer from headache for several years, and at last by accident discovered that my eyes were astigmatic. I at once had them examined by a competent ophthalmologist, who fitted me with glasses. This was four years ago, and since that, the attack of headache have diminished from three and sometimes four per week to one in a month or six weeks. I mention this fact for the benefit of others who may be afflicted as I have been.

Dr. Williams. Rest is something more than change of application. To fully recuperate there must be complete cessation of all work. Change of occupation, or application simply, does not help the case very much; nervous energy is still being used up. To rest the eyes they should not be simply lifted from one object and allowed to rest upon another; this is only change of application, but should be allowed to pass from one thing to another, or the lids closed and the eyes given complete repose.

Dr. Walker. I think change of occupation is just as much rest as is complete repose. In regard to the causes of the damage to our eyes, I think it may be accounted for in some cases by the bad arrangement of the light in the operating room. Light should never be permitted to come from two directions, or to be reflected back from a glaring wall. The walls should be tinted with some soft and neutral color so as to avoid a glaring light.

Dr. Baldwin. I think the range of the paper is greater than that which concerns ourselves. It takes into consideration also rest for our patients. They often have a nervous dread of our operations and are many times in a highly nervous condition from over work. In such cases I am in the habit of prescribing 15 to 20 grains of bromide of potassium from half an hour to an hour before operating and have obtained marked benefit from its use.

Dr. Smith. I think most of us are inclined to over-work our eyes. With the gold operator the strain upon them is great and almost constant for several hours every day; this of course must weary the eyes and tell upon them in a few years, but if there is added to this the effect that of cross lights, as just now suggested by Dr. Walker, they will sooner or later ruin the strongest eyes. With glasses we have but one focus and the eyes cannot get the rest so much needed while wearing them.

I think, however, the trouble is largely due to the effect of the cross lights. I am of the opinion the best place for the light is directly above, and have operated under such an arrangement of the light for years with the greatest satisfaction.

No class of professional men have so much trouble with their eyes as dentists. The close application at such short focus, as suggested by Dr. Marshall, is also an important fact to be considered, and I have no doubt but that it has much to do with bringing about the result just mentioned.

Dr. Williams closed the discussion by saying many dentists fail to secure the advantages to be derived from properly adjusted glasses for fear that it will be considered by their patients as an admission that their eyes are failing, and therefore not to be trusted longer with delicate operations. This is a great mistake. Engravers and watchmakers use artificial helps in their delicate work, and thus save their eyes.

Every dentist should have upon his operating table a large lens mounted with a handle for the examination of his operations, this would greatly lessen the strain otherwise placed upon the eyes.

The chairman announced the next paper on the programme was "Epulis Tumors," by Dr. T. W. Brophy, of Chicago, Ill.

Dr. Brophy not being present, the chairman called for the paper by Dr. Oscar J. Coskery, of Baltimore, Md.

ABSTRACT.

"A Case of Sarcoma of Lower Jaw with Successful Removal," by Oscar J. Coskery, M.D., Baltimore, Md.

Peter King, colored, aged 15, native of Maryland, was admitted into the City Hospital, Baltimore, on March, 31, 1882. Family history good. Personal history as follows: Between two and three years ago his attention was called to a generally enlarged condition of the left side of the lower jaw and swelling of the face. This gradually increased in size. The growth was recognized by his medical adviser to be confined to the inferior maxilla.

The tumor spread in every direction, the teeth were considerably displaced and the tongue crowded well over to the right side of the mouth. About two months previous to presenting himself an enlarged gland made its appearance in the left sub-maxillary triangle.

Operation.—April 15, 1882. The patient was placed under chloroform and an incision was made through the lower lip at the medium line and carried to a point just below the chin, then backwards to the angle of the jaw, passing over the most prominent portion of the tumor, and then upwards to the articulation. The flap was dissected off the tumor and turned up; at this point the facial artery, being cut, had to be ligated. The right central incisor was extracted and the jaw cut through with the metacarpal saw just at the right of the symphysis menti; the bone was then severed from its connections with the soft tissues of the floor of the mouth and strong traction made upon it, when the neck gave way. The bone forceps were applied and the head of the bone together with the remainder of the neck were wrenched from position. Hemorrhage, up to this point in the operation, had not been very great, but upon cutting down upon the enlarged gland and enucleating it, very profuse venous bleeding came on, and it was found that a large branch of the external jugular had been cut, necessitating the application of ligatures at both ends. The flap was then placed in operation and an opening left

for drainage at the angle of the jaw, and covered with dry lint and a bandage.

The boy did well from the first. To control the fetor of the discharge "Listerine" was used as a mouth wash. The flap united kindly and the patient left the hospital on May 6, 1882, twenty-one days after the operation, with only one suppurating point; that left open for drainage, and with very little deformity. The microscopic examination revealed the growth to be a "re-current fibro-sarcoma." The patient has been seen within a year, but there was no indication of a return of the disease.

Plaster models and photographs of the appearances of the face and jaw were exhibited together with the tumor and a micro-photograph of a section of the tumor.

DISCUSSION.

Dr. Marshall. Dr. Coskery states that when last seen about two years after the operation the patient gave no evidence of any recurrence of the disease; of course that is no guarantee that it will not recur, but it certainly gives hope that it may not. I would like to inquire if there had been any reproduction of the lost jaw.

Dr. Coskery. No sir! At least I am so informed by the physician who referred the case to me and who has had frequent opportunities to examine the patient.

Dr. Williams. Have you any statistics with regard to the frequency of such cases?

Dr. Coskery. I have no statistics, but this I can say: Very few cases of a like nature are on record. Many of the best works on surgery fail to notice the condition at all.

Dr. Baldwin. I am certainly pleased with the paper and grateful for the information Dr. Coskery has given us. I fear, however, that the disease will recur. Two years is not long enough time upon which to base an opinion that it will not recur.

The operation was certainly thorough, if we may judge from the specimen exhibited. It is better to go to the ex-

treme of sacrificing considerable tissue than to save too much, for in this last direction the failures are most likely to occur.

Dr. Coskery. The criticism of Dr. Baldwin is just. The microscope revealed the tumor to be a recurrent fibroma, and that would indicate the disease as likely to return. I operated seven times in one case of this character that was located upon the breast, but my patient finally died.

Dr. Walker exhibited several casts of interesting cases of malpositions of the teeth and difficult cases of regulating which he had successfully treated.

The session then adjourned.

ARTICLE II.

THE TEETH OF DIFFERENT PEOPLE.

BY PARSONS SHAW, D. D. S., MANCHESTER, ENGLAND.

In disregard of the great law that we should "not judge by appearances but judge righteously" (which is a fundamental one in all scientific investigations,) perhaps there is no subject on which there is more dogmatic assertion, with less knowledge of the facts, than on the conditions and comparative value of the teeth. And these assertions have become incorporated into our text books, and pass current, when they are in most cases merely the result of ignorance, prejudice, and misrepresentations for a settled purpose. As I have had opportunities for observing the teeth of Americans in different parts of the Union, and the teeth of people from different parts of Europe, as well as some of the woolly-haired Africans, I will record my observations and conclusions, and hope that others will follow with their experience until this matter is settled on a solid basis.

It is a favorite way in Europe of accounting for the superiority of American dentistry by assuming that dentists are more needed in America than elsewhere, owing to the more rapid decay of the teeth. When we get to understand the meaning of this assumption, we find it to be only a part and parcel of a great system. It is taking for granted by European authorities that everything must be wrong in America, as the government, fiscal policy, social life, religion and morals are, according to their views, all based on a false foundation. And then it is argued that, as under pernicious institutions no people can prosper, it is, therefore, natural to find a gradual decay of the Americans, politically, morally and physically. The few who do not quite condemn American institutions attribute this assumed deterioration to the climate; but the degeneration of the Americans in general, and of the descendants of the Puritans in particular, is almost universally taken as a settled fact. The reason why it is not more apparent is owing, so we are assured, to the new blood brought in by emigration. When the average American comes in contact with these views he has no suspicion of their real meaning, and is quite too apt to adopt them without reflection. Or if he begins to make investigations it is usually among his foreign patients, by whom he is misled either through their preconceived notions of American degeneracy, or their conceit. We know that teeth decay a great deal before patients are aware of it, and it is a common thing for them to say their teeth have gone within a few months, when the slightest investigation shows they have been decaying, more or less, for years. It is a common experience in my practice for a foreigner to assure me his teeth never decayed until he came to England, simply because it was after he came here that he happened to have his first toothache, and never had been to a dentist to ascertain the real condition of his teeth. For the same reason the Englishman is certain his teeth never decayed until he went to live somewhere out of England; and the man from the South is

equally certain his teeth were all sound when he came to the North; and the man from the North avows he never had a speck of decay on his teeth until he went into the South; and so it goes all round the compass. It is, therefore, no evidence when the foreigner tells the Americans his teeth were all sound when he came to America, and that teeth do not decay in the "old country" as they do there. His assurances are based upon ignorance of the progress of decay in his teeth, and of the condition they would have been in if he had never emigrated, strengthened by the preconceived notions which grew out of his patriotic bounce. In so readily accepting these errors I am not certain there is not a good deal of something of the same sort of unconscious patriotism in the American who takes for granted the foreigner's view of American teeth. I suspect the logic is something like this. Its postulate is the common and vulgar notion that a higher civilization is only obtained by a corresponding loss of physical powers. Therefore, if we assume that the American has a higher civilization than that represented by the foreigner who comes to his country, it follows on his postulate that his teeth decay sooner.

Just as it is a mistake that higher civilization implies physical degeneracy, so it is an error to assume that the classes who hereditarily live by labor in old and settled countries are physically superior to the hereditarily cultured classes. It is only in new communities that all sorts of people are mixed up together, and wherever the people are settled down in to the regular routine of life they are eventually divided into classes (not by the possession of wealth, patents of nobility that are real or assumed, or by any other artificial means, but) by a course of natural selection based upon immutable laws. There are instincts, modes of thought, motives, ideas of what promotes happiness, and dietary and sanitary regulations which purify and elevate; and there are those which not only prevent any elevation, but must degrade. So that in the same com-

munity we find people with entirely different modes of thought, incentives to action, and consequent results. It is inevitable, therefore, that in the long course of time different classes should arise with fixed types, which are intensified by the constant intermarriage of those of the same blood, social standing and character. No American who has not come in contact with the various classes in Europe, and not had an opportunity to study their characteristics, can have any idea of the radical difference between them, owing to the wide difference in the prevailing notions which govern all their actions. There is but little community of sentiment, except in their common humanity. This is almost at once revealed to those who have to treat their diseases. The superior classes are invariably grateful, patient, and strictly obedient to all commands as to diet, sanitary arrangements and medicines, while the lower orders seem to hate obedience, and systematically disregard the most imperative instructions, especially as to diet, and preclude the possibility of the exercise of any feeling of gratitude by the almost invariable habit of endeavoring to make it appear, in every transaction of life, that it is they who are conferring the favor. The inevitable result of the natural selection I have named is that those who obey the mental, moral and physical laws of life arise to the top, while those who habitually disregard either set of these laws sink to the bottom of the social scale. It is true there are at work, at all times, unexpected and unpreventable circumstances which appear to set aside this natural selection, if not altogether to defy it. And the struggles of such of the lower orders as have got elevated out of their real sphere by some stroke of luck, to maintain themselves in their unnatural position by the innumerable devices to which they resort, are apt to lead their less fortunate and unreflective fellows of the same order to imagine that men are lifted up by means of these low devices and mere assumption. But they are only a part of the system which eventually still more degrades; and it re-

mains none the less certain that when a class rises to the top of the social scale and remains permanently there it is because they obey, on the whole the great moral and physical laws ; and that the lower classes remain such because they are wedded to opinions, appetites, instincts, prejudices modes of thought and ways of life which cannot elevate, but must degrade. In accordance with the foregoing, I have found that those who belong by inheritance, to the upper classes, all over Europe, are in almost every way the superiors, mentally, morally and physically, of the permanently lower orders. The English gentleman has always beaten the common fellow at everything, especially in roughing it in the new countries to which all classes have emigrated from the beginning of the English colonies. It is because the descendants of the very best blood of Europe, and of England in particular, have dug and delved and sowed and reaped from Maine to Georgia for over two centuries, and still give dignity to labor in all parts of America by uniting it to refinement and intelligence, that we have the elevating tone of American thought and feeling. You cannot create a "gentle" man except out of a refined and gentle nature. Wealth, the tailor, the University, and "society" can only put on a transparent surface polish if there is not the hereditary elevating instinct which nothing can smother ; and the snob's descendants invariably go back, sooner or later, to the class from which he sprung ; when, for a certainty, their last state is worse than their first. It is, therefore an entire mistake to suppose the peasantry of any country have better teeth than the gentry, or are in any respect their superior. It is quite the other way. The English are divided into the upper, lower and middle classes, or, as Adam Smith puts it, into those who live by rents on land, those who live by labor, and those who live by profits. The upper class is distinguished by simplicity of manners and of personal living, cleanliness, high integrity, and great frugality. With plenty of fresh air and exercise, and a simple diet, they are

very strong and have excellent teeth. The people of the lower class are uncleanly, eat their food miserably cooked, are passionately fond of dainties, are imprudent in all their doings, and so improvident that, as a rule, they can not lay out their earnings so as to make them spread over a single week, but want food before the new wages come in. The agricultural laborers get plenty of fresh air, and from dire necessity have a simple diet, and in consequence somewhat overcome the evil results of their instincts, and have fairly good teeth. But the artisans among the lower orders have not these compensating benefits, and the effects of their faults are intensified by living in large towns, working in impure air, and above all, by having good wages to spend in indulging their appetites. The consequence is that they have bad teeth. The middle classes is a thoroughly mongrel race, made up from all ranks and classes. It consists of the merchant, farmer, professional man, tradesman, etc. This class is as mixed in England as in the colonies. The uncertainties of all profit causes immense changes in each generation. The great merchant may be the son of a farm laborer and his clerk may be grandson of a lord. It is, therefore, but natural that we find in the middle class all sorts and conditions of teeth, from the very best to the very poorest. It will be a mistake to suppose that because the teeth are bad we can say the patient is from a low family, for I have known poor teeth to go with the longest pedigree; and among the artisans I have seen splendid teeth. It is only the general average I have been giving. The Welch peasantry have the poorest teeth I have ever met in Europe. They are pearly and pretty in youth, but soon decay. The lowest class of Germans have large teeth, as do most inferior people, which serve them fairly well so long as they live out of doors and eat wholesome bread. But they are deficient in vitality, have but little stamina, and if attacked by decay crumble away rapidly. The upper class of Germans have good teeth, but not so vital as the English or the Ameri-

cans. The French of Gothic origin (see Magitot) have teeth much like the Germans; but those of Keltic origin have vastly better teeth. There cannot be a doubt that among the pre-historic people of Europe the Kelts had the best teeth. The Irish are a curiously mixed people. The peasantry, who are the descendants of the aborigines, have coarse, large and not good teeth. All around the coast of Ireland there settled in ancient times, the Northmen, and their descendants have good and strong teeth. Then a very much larger proportion of the Irish are English in origin than is admitted, and their teeth are much like the English. The North of Ireland is almost wholly of Scotch descent, and here we find good, strong, and vital teeth. There is even a more marked difference in Scotland than in England between the different classes. The Scotch peasant has fairly good teeth, and better than his English neighbor. Among the higher classes of Scotland we find the teeth fine in form, compact in structure, and highly organized. In all probability the aristocracy of Scotland is the finest race in Europe. The Danes, Swedes and Norwegians, being a superior race, have fine teeth. The Spanish teeth decay early, and the Portuguese still sooner. The Greeks (I mean the real Greeks) have good teeth, as a rule. They compare well with the English, and so do the Turks and Arabs. What little experience I have had with the woolly-haired Africans shows they have very poor and dark yellow teeth, not white, as is so persistently asserted, with unusually large roots. Now, how do these teeth compare with the Americans? No man who will take the trouble to make careful observations will, I think, come to any other conclusion than that, on the whole, the teeth of the Americans, for strength, fineness of structure, and vitality, are decidedly superior to those of any other people. And conservative dentistry flourishes in that country, not because the teeth are unusually bad and need more than usual attention, but from the very opposite reason. It is because the teeth of the Amer-

icans present a very much larger proportion, than that of other people, of those which experience shows the dentist can save by proper operations. The great drawback to conservative dentistry in other parts of the world is found in the fact that the teeth are, except among the better classes, relatively poorer, and can not be saved by the same skill as can the American's. There are more dentists in America because of the general superiority of the teeth, the natural desire to save them, and the comparative ease with which this is accomplished. And dentistry will remain, in most other parts of the world, because of the nature of the teeth of the mass of the population, to a very great extent very much what it always has been, the means for supplying the inevitable false ones.—*Archives of Dentistry*.

ARTICLE III.

CHEMISTRY IN LIFE AND IN DEATH.

BY GEORGE WATT.

[Read before the Xenia Academy of Medicine]

Chemistry is so boundless in its bearings, so infinite in its reachings, so constant and unremitting in its efforts, and so varied in its facts and affinities, that no human mind can grasp it in any of these various relations, nor can finite minds conceive the wide range of its possible inquiry, research or action. All will agree that its function is co-extensive with matter; but as a science it is not pent up by material barriers. Extend your thought along the pathway of the material universe till you have reached, not only the farthest star or satellite, but till that thought, hitherto a wanderer, rests on the outermost atom of creation, and still, because the containing is more extended

than the contained, there must be space beyond. Now, whether or not this space is empty is known to the Infinite One,—to the possessor of all knowledge; but the only science that can investigate and report as to the presence or absence of matter therein, is called chemistry, the science that tyros propose to teach in a college course of a few weeks or months.

To gain something of an idea of the busy nature, the industry, the prying meddlesomeness of chemistry, it is best to confine our observations, for a time, to the action and influence of but a single element, as a view of the whole range would overtax our vision.

Because it is the most abundant, and perhaps the most observable, oxygen may be taken as a fit specimen to illustrate chemical action and energy.

And where shall we begin our observations? for where shall it be found? Or rather, where is it not? Most certainly it is not omnipresent; but if we ascend to the top of the highest mountain, it welcomes us in the refreshing breeze, or corrodes like a canker, in the character of ozone. Dig down into the deepest mines, or explore the most minute recesses of the secret cavern, and our presence fails even to surprise it. The oceans are its reservoirs, the clouds and the storms are its messengers, the earth is its treasure-house, and the rocks its safe-deposits. It is about us, in us, of us. If we walk, or if we work, we gain the force essential to the effort, by this wonderful agent, oft a tyrant, but now a servant, obedient to our will, combining with carbo-hydrogen compounds, which must be constituent materials of our physical bodies, and in the complex process, we find the chemical power of this element changed into vital force, and this with the mechanical force necessary to the accomplishment of the acts performed. It follows, as a matter of course, that the tissues oxidized to generate this force are devitalized, and thus we see the chemistry of death to the individual tissues, while it is the chemistry of life to the body corporeal.

This element, oxygen, gets into our bodies in two ways. It is an essential constituent of most, if not all parts of living tissues. And although it is built into our bodies in obedience to the vital processes and functions, it is ever true to chemistry,—to the laws of affinity; for no matter how many sciences are concerned in our make-up, there is no warfare among them. The oxygen that becomes identified as a component of living bodies is taken in with and appropriated from the food. That taken in by respiration can never be so assimilated, but is for purposes entirely different. The oxygen taken in by breathing is stored within (or at least among) the red corpuscles, not for the building up, but for the destruction of tissues. This oxygen is used to generate, or liberate force, which may be chemical, vital, and mechanical, in turn, on the principle of correlation.

And another thought is here necessary to a clear understanding of the processes concerned. We often find oxygen an irritating, corroding agent, yet it is a leading constituent of our balmy atmosphere which fans us with its gentlest zephyrs, "Where the Wind of the West breathes its softest sigh."

It is often as docile as the tamed lion that fondles the hand that feeds him; and again it is as furious as the same lion aroused in his wrath by a taste of blood. Nothing can seem more tame than either when quiescent; but aroused, one becomes the terror of the arena, and the other the fiercest and most destructive element of the material world. Think of the gentle breezes of June at the hour when Aurora gilds the eastern sky, and you have this element altogether amiable and pacific. Think again of a condition in which by correlation of forces, heat becomes affinity, and this voracious element must have Chicago for breakfast and Boston for lunch, and at the close of Time's day will take the whole earth for his supper. And how is this all explained?

We can advance at least a step in the direction of

light by calling to our aid the principle of allotropy. Some chemical agents possess at least two distinct chemical states; and these are sometimes so very unlike each other that the identity of the agent is doubted. And this is all the more likely to occur when the substance is not obvious to our ordinary observation. If memory serves, an effort was made in this Academy to illustrate what is meant by allotropy, by considering iron in its active and passive states. Be this as it may, the illustration is a good one, and will bear a second use.

It is well known that when iron is introduced into a somewhat concentrated watery solution of nitric acid, it rapidly decomposes both the acid and the water. This is true of iron in its ordinary state, in which it is chemically active. The iron decomposes the fluids at its own expense. It is rapidly oxidized, and as atom after atom of its oxide is formed, it combines with equivalent of the remaining nitric acid, and nitrate of iron is the result. But when the iron is rendered passive before entering the acid solution, no chemical action occurs. Iron may be rendered passive by several processes; but a convenient one for those who wish to try the experiment is the following: Before immersing the iron, place it in contact with platinum, and introduce both metals in such way that the platinum first comes in contact with the acid solution. After the immersion, the platinum may be withdrawn, and the iron remains passive.

That oxygen has its allotropic conditions is evident from even slight considerations. Were it active when stored in the red corpuscles, it could not fail to burn the phosphorized fats found there, as scarcely anything is more combustible. Again, oxygen may be prepared by one of the ordinary methods, such as by the decomposition of potassium chlorate, and a strip of iron may be suspended in it, almost indefinitely, without showing signs of rust. In this state it may be rendered active by passing sparks of electricity through it; and in its active state it is called ozone.

In being set free from any of its combinations, oxygen escapes in its active state, in this obeying a general principle; for it is found by experiment that chemical reagents act with increased energy under such circumstances. They are often spoken of as being in a nascent state, when they have this increased affinity as a result of being just set free, or being just formed by combination, in the case of compounds, for it is not necessary that the agent be elementary in order to such manifestation.

It has been mentioned that the passage of electricity changes passive, or quiescent oxygen to active; and as there is always more or less electric disturbance in the atmosphere, it can never be free from active oxygen, or ozone. It follows, therefore, that oxidizable substances exposed to atmospheric influence are more or less oxidized. The oxygen is always present, and always a portion of it is ready for action. When, from any cause, electric disturbance is much increased, the proportion of ozone in the atmosphere becomes so great that the lining membrane of the air passages is badly irritated; and while some persons are more readily and to a greater extent disturbed in this way than others, and epidemic catarrh, usually called a "bad cold," prevails. Under the same circumstances the mechanic and the artisan find it difficult to prevent the rusting of their iron and steel instruments and tools.

If true, as we believe, and have already intimated, that the affinity resulting in oxidation within the system is; by correlation, changed into vital force, it seems advisable to now give the basis of voluntary effort of both mind and body. The oxygen is stored in the corpuscle in its passive state. While it remains in this condition, the corpuscle can carry it with impunity. It seems almost certain that the effort of will power can change it from the passive to the active state. Thus changed it acts on the tissue it touches, kills it, or at least a portion of its molecules, and this affinity is correlated into vital force which results in voluntary effort. How the will renders it active, and es-

pecially how it renders the right portion active, so that the proper molecules are oxidized, is beyond the range of our present knowledge; yet it is only one more illustration of the influence of mind over matter, analogous to the principle that "He spake, and it was done." And after all, we know as well how the will renders oxygen active as how electric sparks accomplish the same end. That is, we know nothing about either.

While the system is in proper health—all the organs and functions normal—the red corpuscles are able to receive and carry a due supply of passive oxygen. And it has been ascertained by careful experiment that the supply intended to originate, or rather liberate force for voluntary effort, of mind or body, is received and stored away during sleep. And this is the principal explanation of why we must sleep. As long as the will can so control the corpuscles that none of the stored oxygen becomes active except in obedience to the will, the individual is, or can be calm and steady. But when, from any cause, such control is not complete, involuntary motions, twitchings, etc., occur. An extreme illustration of this condition is found in *delirium tremens*.

When from exhaustion or other cause the will has lost control of the stored oxygen, if the supply is still abundant, there is great irritability or restlessness, while considerable physical strength remains; but when the supply is nearly exhausted, extreme debility accompanies the irritability. Various medicines are used for the purpose of restoring this lost control, among them coffee, tea, tobacco, opium, and even alcohol, the latter giving at best but very temporary relief. It is claimed, however, that alcohol gives indirect relief in such cases, by furnishing fuel for the straying oxygen. If this is true, and it seems reasonable, the oxidation of it may result in saving tissue from similar destruction by the merciless element.

By way of condensation of thoughts already expressed in a somewhat scattered arrangement, let us bear in mind

that in the formation of tissues and structures of the body, oxygen plays an important part, that it is an essential and an abundant constituent of our bodies, present everywhere, as it claimed by some physiologists, in quantities sufficient to oxidize or burn up all the other elements found in association with it. In the formation of tissues and structures of living bodies, whether animal or vegetable, it exists in combinations which satiate its affinities, and it is therefore quiescent. As long as any tissue is alive and normal, it remains in this condition, and seems to have no disposition to disturb any vital process or structure. Whatever life force or vitality may be, it seems to afford even highly oxidizable materials the ability to resist the action of oxygen, at least in its passive state, as has been already referred to in reference to the phosphorized matter in the red corpuscles. Or, perhaps, it would be more philosophic to speak of vitality being able ordinarily to hold the oxygen to its passive condition. Most, if not all the text-books speak of vitality being one of the circumstances that modify affinity.

And further, in this condensation, let it be remembered that the circulating fluid, the blood is saturated with the same element, much of it passive, yet a portion of it as ozone, while other portions are in combination with carbon, hydrogen, phosphorus, sodium, potassium, etc.

And now, with the condition in life, how, and what in death? With vitality gone, the structures, lately so full of life, are masses of inert matter, subservient to the laws of the inorganic kingdom, and each element, or compound radical, is obliged to look out for itself, amid the many—the almost innumerable affinities awakened by the shock of death. In order to conceive how long it will take oxygen to assert its power over the dead tissues, and to begin its destructive work of decomposition, think how long it will take an electric spark, after the striking point has been reached, to pass through an atmosphere of oxygen, thereby rendering a portion of it active. In other words, the change

is instantaneous, and as no part of the body is free from contact with oxygen, it follows that oxidation must begin as soon as vitality has ceased. No time is lost in the correlation of forces, for though matter may be quiescent, force can not. Think for a moment, about the possibility of gravitation being suspended.

The statement above, in reference to instantaneous action after the cessation of vital force, is not strong enough, for it often occurs that vitality becomes so enfeebled that affinity overpowers it and oxidation takes place before death. Accordingly we often see putrefaction while life is still retained.

This view of the case may suggest the still disputed question as to the precedence of chemical action and micro-organisms, in putrefaction. The oxygen is always there, and ready to act, and can not be prevented from thus acting, but by a change in the laws of affinity, which are laws of the Unchangeable God, and it is difficult to imagine that micro-organic germs can make better time, get their work in earlier, or show more efficient action, however much they may assist in the process as secondary agencies.

Not only is the body built originally, and also continuously nourished in strict obedience to chemical laws; but every morbid change and every diseased action are caused by and conducted in accordance with these same laws. We can not even think till a molecule of the gray matter of the brain has been oxidized as a burnt sacrifice on the altar of life. Not even the great tempter can turn our thoughts into vicious channels except by producing a chemical change in a portion of brain substance.

And on the other hand remedial agents can not arrest disease or restore the ailing body, without producing chemical change of texture and tissue. Some talk of dynamic medicines, or rather medicines which act dynamically; but so far, on soliciting an explanation of the terms used, we have found them simply veils for the concealment of ignor-

ance. But even if we recognize a cure by dynamication, we have only admitted that force, as well as matter may be remedial, which has never been denied; but force can so act only by causing chemical change; or at least it can not act without producing such change.

Like matter, force is indestructible. One form of it may be changed into another, as light into heat, and that into electricity, and that into mechanical force, etc.; but in these, and similar correlations, nothing is lost. These occurring in connection with matter, however, must always result in chemical changes therein.

Bearing in mind the principle that force can not be inert, but must be active, we can understand some of the phenomena pertaining to chemical changes accompanying, or resulting from death. The elements and compound radicals, no longer controlled by affinity as modified by vitality, are, to an extent, liberated, and each seeks new companionship in obedience to affinity unmodified by vital force. On this principal much of the nitrogen in the system combines with hydrogen, while sulphur, and also phosphorous unite, in large proportions, with the element. The first of these compounds is alkali, and it further combines with the other two, which are acids, as well as with carbonic acid, which is also liberated abundantly from dead and putrefying bodies. And nothing in Nature is more self-evident than the fact that the force known as affinity, in its control of chemical reagents, is fully able to dispose of, and return to its kindred dust, any organic body deprived of life, without the aid of micro-organisms, maggots, or vultures. Yet it does not follow that it must reject the aid of these agents, in the disposition of the dead; but it does follow that neither germs, "nor any other creature," can be able to exclude chemical action in the process. When we bear in mind that the oxygen stored in the corpuscles is held passive by vital force, and that it is rendered active by death, we must recognize the immediate commencement of oxidation. The free electricity in the overcharged cloud

will not likely await the departure of the cattle before striking the isolated tree in the pasture field, nor will affinity wait for the production of germs, and the commencement of their work, before starting active oxygen at its destructive processes. One force is as likely to wait as another. —*Ohio State Journal of Dental Science.*

ARTICLE IV.

THE RECKLESS SACRIFICE OF TOOTH SUBSTANCE IN DEVITALIZED TEETH.

BY W. N. MORRISON, D.D.S.

[Read before the Southern Dental Association, New Orleans, April, 1885.]

There is an operation of great importance that I have never seen discussed before in our societies, or alluded to in the professional literature, that I would like to call attention to. That is the reckless sacrifice of tooth substance in devitalized teeth. By some of the old operators we have been instructed when opening dead teeth to cut freely, and to make the opening large, so we can see into every part of the cavity, and in many instances drill out the individual root canals, removing solid dentine from the best part of the crown of the tooth, unnecessarily weakening the tooth in the place where it should have the most strength, burring it out to the extent of one-eighth of an inch or more in diameter. In many instances these roots are filled with cotton, and this cavity is filled full of whatever material is used, leaving only a thin, frail shell of dentine between the filling and the enamel. Soon follows the breaking down of these walls, by the ordinary use of the jaw in mastication. I have always felt that there was no excuse for this wholesale destruction of so important a part of the teeth, and have been

working in a line to save all the crown substance of dead teeth possible and with the method of root filling which I have used for many years, I find the range of possibilities in this direction very great. Of all materials used or recommended for canal fillings, I have never found anything equal to pure gold wire, of size to correspond to the size of the different canals. The method in which I apply it is described in detail in the *Missouri Dental Journal* for 1874, page 51.

By following out the method described in this article, it will be possible for almost any ordinarily skillful operator to fill the canals of the molars through an opening not to exceed one-sixteenth of an inch in diameter. This opening must be made directly in the center of the crown, with a drill of that size, and then, with a round, or truncated-cone-bur, the sharp angle of the pulp-chamber at the lower end of this hole is slightly funneled, by which access is had with small steel broaches, for the removal of the dead pulp, and the cleansing and treatment, if necessary, of these canals with medicated cotton. And just here I wish to give a word of warning against the over-treatment of canals where the pulp tissue is entirely removed. When I am certain that the root vessels are all removed, and there is no inflammation in the peridental membrane, I fill such canals immediately, often leaving one or two of the other canals for subsequent treatment, where I am not certain the tissue has been removed.

I recently had a case of a lower first molar, with a very large mesial cavity of black decay, which progressed slowly, and was of long standing; a gentleman about forty-five years of age. Being uncertain as to whether the pulp was in a healthy condition enough to live, I gave it the benefit of the doubt, and put in a large filling. The tooth remained comfortable for several weeks, and finally it began to have neuralgic disturbances on that side, with flashes of pain occasionally, and extreme sensitiveness to thermal changes, both of the air and food, the pain recurring nearly always

at night. The gentleman exercised a great deal of patience with it, and was equally anxious with me to keep the pulp alive; but one morning he came to me and said he could endure it no longer. The tooth was quite sore, and I found enough peridental inflammation to warrant me to make an opening into the pulp; which I did through the top of the crown, not removing the good mesial filling, but made a small hole, not exceeding one-sixteenth of an inch. I removed the vessels from one of the roots without much pain. Those of the other root were exceedingly sensitive, and I devitalized them with arsenious acid. In removing the pulp, I discovered quite a nodule of secondary dentine, about the size of quail shot, in the pulp chamber. You will readily appreciate my dilemma. With a small, sharp, barbed broach, I tore all of the pulp tissue from this nodule that would catch on the broach, and pulled it toward the orifice, and as the broach would draw it through, it would disengage itself from this little nodule, which I could feel was perfectly smooth. After I had the vessels all removed from these roots, I rolled the nodule forward over the orifice in the mesial root, and with my gold wire nicely fitted to the distal root and with a little chloro-percha to fill the interstices between the gold wire and the root walls, I filled the distal root solid and secure to its end. Then with the instrument I rolled this nodule back over the orifice and filled the mesial root in the same manner.

In all my operations, I endeavor to accommodate the instrument to the case, instead of cutting valuable tooth substance to suit bungling instruments. In lateral incisors, for instance, where a dead pulp is diagnosed, I drill an opening exactly on a line with the pulp canal that will just admit the size of wire that I use for such canals, and no larger.

ARTICLE V.

A COMMON SENSE PIVOT TOOTH.

BY DR. L. C. ADAMS, DAYTON, O.

As all readers of the dental periodicals know, there are many ways of setting artificial crowns on crownless roots. The writer has tried a number of them, and has had satisfactory success with some, and total failures with others. Whether the failures resulted from defects in the plan, or from inability to properly manipulate, let the reader judge. And right here I wish to call attention to the fact that many roots supposed to be worthless, can be made useful by setting artificial crowns on them.

A case in my practice illustrates the efficiency of the principle: A gentleman called to have the roots of three front teeth extracted, and corresponding teeth inserted on a plate. Seeing that the roots were healthy, I advised him to have crowns set on them, and thus avoid a plate. He consented, and the work was done, and now after a lapse of eight months they are doing good service, and have given full satisfaction. The teeth had been broken off from these roots many years before.

The mode of making and applying the tooth with which I have been most successful, is very simple; and any dentist that can use a blowpipe, and flow hard solder, can adapt it with complete success.

First prepare the root, as for the old method of setting a pivot tooth with the antediluvian wooden peg. Make a hole in the root about a quarter of an inch in depth. A good drill for making the hole may be made by taking a fissure bur drill, three thirty-seconds of an inch in diameter, and grinding to the desired shape. Enlarge the hole slightly at the upper end, then make a tube that will snugly fill the hole without being too tight, leaving the tube projecting a

very little. Use platinum, or silver. Then make a plate to fit the prepared root, having the same diameter as the root. Make a hole in the plate to correspond with that in the root, and just large enough to admit the end of the tube. Fit the two nicely together, and fasten with wax, and then remove and invest in sand and plaster, equal parts, and solder the plate and tube together, and also the seam of the tube, if not previously done, allowing no solder to flow into the tube. After this take a plain plate or rubber tooth, and fit it to the root, seeing that when thus fitted, it properly antagonizes. Grind it back well so as to give free access to the hole in the tube, then back-line the tooth and fit it to the root, with the plate and tube in place, and then fasten as before, and remove and solder together. After this, warm the tooth, and place it on some gutta-percha softened by heat, and insert into place on the root, and hold firmly until it has become cool, and then remove and trim off any surplus gutta-percha. By using the gutta-percha thus, a water-tight joint is secured. Dry the root with warm air, and fill the hole in it with well mixed cement, and press the tooth firmly to its place on the root, and with suitable instruments, pack the cement into the tube until it is full. After it has hardened, drill a portion of the cement away, and fill that portion of the tube with amalgam, mixed as dry as it will work, and this completes the process.

This mode of adapting the tooth was first brought to my notice by Dr. C. Bradley, of Dayton, Ohio.

ARTICLE VI.

THE POISONOUS EFFECTS OF AMALGAM
FILLINGS.

BY THOMAS FLETCHER, F.C.S.

The paper of Dr. Talbot on this subject reads like a paper written fifty years ago. If he had taken the trouble to test his own instructions for mixing he would have found that it is impossible to squeeze mercury out of the mixture. What he mistakes for mercury is a solution of some of the metals which should be left in the alloy, the removal of which almost invariably damages the amalgam. He would also have found that it is simply impossible to squeeze the surplus mercury out of any compound amalgam, the quantity of mercury left in being quite double what is necessary to make a good amalgam. The "bond of union," if the mercury is in proper proportion and not in excess, is most certainly strong enough to prevent evaporation at ordinary temperatures. My own experiments with amalgams in the steam pipe of a high pressure steam engine showed conclusively that there was no loss of weight after three months' exposure; on the contrary, every plug showed a trifling increase in weight owing to surface oxidation.

Dr Talbot evidently puts all amalgams in the same basket, and believes that all amalgams shrink. If he had ever experimented with precipitated silver he would have been more cautious and more correct in his statements, and as to the question of porosity of plugs, it is quite possible to make either an amalgam or gold plug porous to any extent, as it is also possible to make either material watertight.

Dr. Austin's idea of lining a cavity with tin to take up surplus mercury is simply a makeshift and risky way of

getting rid of what never ought to have been put in the amalgam, and the statement of Haswell quoted that "amalgams expand" is simply a proof that his experiments have been very limited and confined to one or two metals only.

The bulging of a filling which Dr. Talbot apparently takes as a proof of shrinkage, he will find has nothing whatever to do with this. If he will make a plug shaped as a true cube he will find it will slowly bulge on all six sides and the corners will draw inwards, showing a strong tendency to assume a globular form. That the amalgam is apparently hard proves nothing. Ice will flow under pressure and the tendency to assume a globular or spheroidal form after hardening varies with every different alloy.

That mercurial poisoning may occur in some cases where plugs are made with the grossest carelessness and an immense excess of uncombined mercury, may be possible, although I have never once, in twenty years' practice, seen such a case. But this, even if it does occur is a proof, not that amalgam *per se* is in fault, but that the dentist does not understand the material he is using. Any dentist who puts in a filling saturated with uncombined mercury had better discontinue using all amalgams until his education becomes more complete.—*Brit. Journal of Dental Science.*

EDITORIAL, ETC.

THE PRACTICE OF DENTISTRY IN GERMANY.—*Separate copy from the Cologne paper of the 5th of Nov. 1884.*—The instalment of the liberty of trade has led to the largest consequences in regard to all the medical science. In all German countries in former times only they had the right to practice who had passed examination before the board of government. Now after the fixation of the German order for trade of the year 1869 is the practice of medical science not more bound to a proof of the capability, but everybody is allowed to practice the "physician's" trade, only the sign of the right as "physician" (pract. physician, surgeon, dentist, Zahnarzt and so forth) is dependent from the possession of an approbation. Besides, of that possession of right, got in foreign countries, every mark as physician, etc., is allowed, if here is only added to it, "approbated in foreign countries."

This license of the physician's helping hand and the right to bear a title, got in foreign countries, has not been without the doubtfullest consequences in Germany. You may particularly see, that, in the branch of dentistry we have entered here, in situations that cannot remain so for the future. The number of those persons who have not enough, and no prefiguration at all, is now very large. They are using and practising mostly under the title as "Dentist, Zahnartist, Zahnoperator, Zahntechnickereh." Thus you will find at Berlin more than 160 of such "physicians" and yet not 60 dentists approbated in Germany. Those teeth-operators, etc., who use the liberal legislation for the disadvantage of suffering mankind, have been either helping hands at dentists' or barbers' offices, or they have got their education in one of these private institutions, that make a good deal of money by instructing young

men in Dentistry in 4—5 weeks, so far that they may practice for themselves.

Now, besides those persons who practice Dentistry like a handicraft, there are still a number of "physicians" viz: the dentists "approbated in foreign countries," who take this title to avoid German examination for dentists. The most of these dentists have got their "approbation" from the U. S., of North America. It is well known, for a long time, to all German dentists, (in the circle of the profession) what mischief is done by the American dental colleges with the conferring of diplomas, particularly to Germans, by taking every foreigner into the college, without any regard to his education and capability if he only pays the high fees; then they will give to him, or everyone of them, the diploma as "doctor of dental surgery" after 4—5 months being passed. That these "studies," as well as the examination made by help of an interpreter, does not deserve that name, when we know that the most American dentists in our fatherland do not understand the English language; and yet it is said, that they had been able to be instructed by English-speaking teachers and to have approbated in 4—5 months all the dental science. The examination of such a man in regard to his improvement and capability is without any value and merely a matter of form, that serves only to procure a rich income to the dental colleges, which are private institutions and even without any control and support by the government.

But there is further a number of so-called "American dentists" who have not been in America at all. Many of these pseudo-doctors were already punished in the last years by German Tribunal and obliged to abdicate their title, received "in absentia." They had bought their titles for a few dollars from one of these American bogus-parties which have a good trade with their doctor-diplomas. The most known of them is the Philadelphia University, Livingstone University and Wisconsin Dental College. In defiance of these detestable cheats, always told and judged in German dental journals, yet they have got a great extension in Germany, thus that without help of a law the oppression of this cheat cannot be expected. It is a matter of course that the reputation of the

dental profession is dishonored by such cheats. The ministers of culture at Berlin has them also in the last time acknowledged this great mischief in the region of dental practice, by the action of the writer of these lines, and measures for their regulation will follow.

We expressly speak of the great merits that the U. S., of North America, have gained about the development of dental science and acknowledge it willingly. The influence of the American school has been of great importance twenty years ago, not for dental science in Germany alone, but for dental science in general. Just these circumstances may have been the reason, that nowadays the above said mischief is possible, and that those dentists, provided with such bought doctor-diplomas enjoy the public confidence.

The high degree of development which dental science gained in America prematurely, was also the cause that so many German dentists (the writer of these lines too) went over to America, after having finished their accomplishment at home, (and yet still go) to enrich their experiences and intuitions, like young German physicians go to foreign universities to gather further experiences. It shall not be unsaid that among the American dentists who practice in Germany, and are natives and had a regular accomplishment in their fatherland are many clever and educated men. But the most of the people who nowadays are visiting the dental colleges are such people who are not admitted to a studio in Germany because it is not to be expected that they can study with any success.

For all these persons it is only a matter to avoid the fixations current for the obtainment of the dental approbation in Germany. The same may be said of all those who have got their approbation in Belgium, Holland, Switzerland, etc., and from all the dentists who approbated after 4—5 months being passed, there is no more to expect than from the great number of dentists or teeth-artists which did not approbate at all. How much damage is done to the people, you may readily see at their enlarged manner of administering laughing-gas and chloroform for the performance of painless operations. In our fatherland to dental science was unhappily not devoted the necessary attention in former times. First by the instal-

ment of the fixations, current in 1869, it was higher esteemed. In the latest time dental science has gained a very great signification, not alone because the amount of people suffering from teeth-sickness increases daily, and the most possible conservation of unhealthy teeth that require a scientific treatment is acknowledged as the principal matter in dentistry, but also because the improved medical knowledge has shown new relations between diseases of teeth and other sufferings, namely, certain nerves and important organs, (eyes, ears, etc.), thus they are looking forward to repair in dental science and devote to the accomplishment of dentists double care, what in former time had been omitted. This struggle has led to the reconciliation of a want felt since a long time. At Berlin and Leipzig two chairs for dentistry are now established which enables the students to obtain a punctual, theoretical, as well as mechanical, accomplishment. It is to expect that still other universities establish such chairs and that particularly the universities in south Germany will follow the example. Will these new instalments fulfil their purpose if we remain in the dark and mixed situations, where it is possible for any one in obtaining a worthless diploma in a foreign country, through which he can avoid the examination and prove his capability, which is necessary for the success in scientific surgery? We don't believe that. If we look for the reasons why just in dentistry we see these bad consequences from the liberty of trade, so we find that the motive is to be found in the ignorance of the people, even in the highest classes not to be enabled to distinct scientific dentistry from quackery; while on the other hand, distinction between an approbated physician and a quack, they know very well. Of course, there are still some other reasons. The number of dentists was very small in Germany in proportion to German physicians at the instalment of liberty of trade. Even the uncleverest "teeth-artist" could make money particularly as people did not know anything about right treatment of teeth, through this ignorance they could take advantage very easily. The universal well-known fear for operations upon teeth may be the reason that so many people fall into the hands of quacks, persuaded by debauching advertisements. It is a very inter-

esting fact that practice in dentistry even in the "liberally" Great Britain and in the U. S., of North America, is subjected to far more restrictions than our laws allow, although they are not taken as liberal, and yet they allow the greatest liberty in the region of medical science. In none of these countries it is allowed that a medical person, approbated in another state, can practice in dentistry or as a physician.

It is therefore reasonable that for some time not only in dentistry but also in other branches of medical science efforts have been made to go a step backwards in the rules of the laws, through which great advantages would be gained by the public as well as the faculty.

By all means it is necessary to revise the laws of dentistry in Germany, so it does not fall still more into the hands of quacks and stop the further development of the same.

Hof Zahnarst,

DR. ADOLF PETERMAN,

Frankfort a—m.

MONTHLY SUMMARY.

GALVANISM FOR NEURALGIA.—Dr. Mattison, of Brooklyn, calls attention to the value of galvanism for the relief of neuralgic pain, not because there is anything new in the treatment, but to point out the fact that electricity may often be used instead of morphia, and spare the patient the danger of contracting the opium habit. He has found that very weak currents only are required in most cases, and laments the absence of small galvanic batteries easy to carry about, believing that the bother of transporting the galvanic batteries of the usual "portable" size often prevents physicians from trying the remedy.

The method of application which he recommends is to place the positive electrode over the point of issue of the af-

sected nerve from the skull or spinal column, and the negative pole over the seat of pain. About the head and face the strength of the current should be such, as, when broken, to cause a metallic taste in the mouth, or slight flashes of light. The usual length of sitting is between five and fifteen minutes, but sittings shorter than five minutes may be sufficient for the relief of the pain, or it may be advisable to continue a sitting beyond fifteen minutes if there be steady relief of the pain under the application. The frequency of the sitting should depend upon the frequency of the attack, every paroxysm of pain being met with an application of electricity when possible. As an illustration, a case is quoted from Dr. Tibbitts where a patient had suffered from neuralgia for two years having from six to twenty attacks daily. On the first day the electricity was applied twenty times. Improvement was rapid; the applications were reduced in number in correspondence with the diminished frequency of the attacks, and at the end of a month were made but twice a week. In three months the patient was cured.—*Iowa State Med. Reporter.*

EFFECT ON OFFSPRING OF CONSANGUINEOUS MARRIAGES.—Dr. Charles F. Withington, of Boston, presented at the recent meeting of the Massachusetts Medical Society a tabulated report of 108 consanguineous marriages. 413 children were born from 103 couples. Considering as "unhealthy" even those having strabismus, those developing phthisis late in life, those who were below the average in intelligence or bodily vigor and those who died in infancy, there remained 312 healthy children. There were 12 cases of deaf-mutism, 7 of insanity, 13 of idiocy and 15 of phthisis. In 17 cases one or both of the parents were themselves descended from a consanguineous union. 15 were fertile, producing 68 children, of whom 48 were healthy. The view was announced that the evil results were due to the operation of the ordinary laws of morbid inheritance, and that consanguinity *ipso facto* had no influence either for good or evil.—*N. Y. Med. Journal.*

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ARTICLE I.

ADDRESS,

(Delivered before the American Academy of Dental Science, at their
17th Annual Meeting, held in Boston, November 5, 1884.)

BY EDWARD N. HARRIS, D. D. S., OF BOSTON.

*Mr. President, and Gentlemen of the American Academy of
Dental Science:*

With thankful hearts to Almighty God, the giver of all good, we meet to-day to celebrate this Seventeenth Anniversary of our Academy.

I am not insensible to the high honor that you have conferred upon me in selecting me to deliver the Annual Address before you upon this occasion, and follow in the long line of eminent practitioners who have preceded me during the years that are past. I appreciate this compliment, coming as it does from a society which bears so high and honorable a record, and in which I have felt a lively interest from its earliest organization in 1867, down to the present time; and from an association of professional gentlemen whose acquaintance and friendship I have enjoyed through many years, and for whom I entertain the highest feelings of fraternal respect.

Associations like this unite men of different opinions,

and conciliate friendship among those who might otherwise have remained at a perpetual distance.

In my remarks to you to-day, I will first speak briefly of the early history and the progress of this Society, and of some of the advantages that dental societies are to the profession and to the community. I will then say something about the advancement the art and science of dentistry has made since I first started out as a dental practitioner, thirty-one years ago; and, lastly, I will call your attention to a subject which is agitating the public mind at the present time, viz.: Christian Science, or Metaphysical Healing, or what is frequently termed the Mind Cure, and which may have an important bearing upon our profession in the future.

This Anniversary measures another year in the onward march of our own developments and achievements for the profession of our choice. This day is to us a resting-place in the history of our labor and our progress. It is that future of our early hopes to which our eyes have looked, our hopes have longed, and the feeling is strong upon us now to sit down together around the old camp fire and rehearse the struggles and the triumphs of the past, and live over again the many pleasant occasions we have enjoyed, and speak of the many grand events that have taken place, and the noble work that has been accomplished during the past seventeen years in and through this American Academy of Dental Science.

It was my good fortune to be present at the opening day, October 19, 1867—a day I shall always cherish in memory—when a few of us gathered together and started this Academy into life.

This was the second dental society instituted in Boston, the first and only one preceding it was the Massachusetts Dental Society, organized in 1864, of which I was one of the original founders.

The small band of professional dentists who assembled to take into consideration the expediency of forming this Academy, met with considerable opposition, but they were men of resolute purpose, and with strong love for their

profession, possessing an earnest desire for the advancement of dental science, and they felt that if such an Academy could be formed it would receive the encouragement and co-operation of a large portion of the better class of practitioners, and the best interests of the profession would be promoted, and great good would result to the public.

As we take a retrospective view of the past, and note the progress made from year to year, we shall see that the anticipations of those original members who projected this enterprise have been more than fully realized. For a while at first it was misunderstood by some, and misrepresented by others, as an exclusive and aristocratic movement; but unmindful of this, the Society moved steadily forward, doing its appointed work, and within a few years gained a firm hold on the confidence of the community, and commanded the respect of the profession throughout our entire country and in Europe.

From the catalogue issued the past year, I find that since the formation of the Academy, one hundred and twenty-four members have been admitted, including among them many dentists of eminence in America and Europe, and making a roll of membership of which this Society can feel justly proud. The names of our honored presidents and orators are familiar to you all—they need no encomium from me.

Elisha T. Wilson	Elected 1867
Daniel Harwood	" 1868
Joshua Tucker	" 1873
David M. Parker	" 1875
Elisha G. Tucker	" 1877
Jacob L. Williams	" 1879
Thomas H. Chandler	" 1881
George T. Moffatt	" 1882

OUR ANNIVERSARY ORATORS.

Elisha T. Wilson, of Boston	1868
Daniel Harwood, of Boston	1869
Joseph H. Foster, of New York	1870

John H. McQuillen, of Philadelphia . . .	1871
Philip H. Austen, of Baltimore . . .	1873
W. W. Allport, of Chicago . . .	1874
Robert Arthur, of Baltimore . . .	1876
William H. Dwinelle, of New York . . .	1877
Charles W. Eliot, President of Harvard University . . .	1878
C. A. Marvin, of Brooklyn, N. Y. . .	1879
Joshua Tucker, of Boston . . .	1880
Frederic N. Seabury, of Providence . . .	1881
Frank Abbott, of New York . . .	1882
Norman W. Kingsley, of New York . . .	1883

Nearly all of the addresses delivered by these gentlemen have been published by the Academy, and copies are on file with our librarian for permanent preservation.

During these seventeen years, twenty-six of our number have been called away from earth, and have entered the land of rest and immortality. They have passed through the change which the world calls death, but which is only a transition to a higher degree of life and an ascent in the scale of existence. And it is fitting that we here pause for a moment and drop a silent tear, and speak a word of tribute and affection to the memory of those departed brothers, whose able counsel, genial companionship, and cheering words, we enjoyed at our monthly and annual meetings through many years.

Their seats are vacant here to-day—we miss them—and though their beloved faces we can no longer see, and their familiar voices we can no longer hear, yet in fond recollection we can see and hear them; and now, as this Anniversary hour comes on, we can still feel their living presence inspiring us with renewed hope and zeal in our profession, and with love for one another and charity towards all mankind. The memory of the just is sweet, and theirs will live in hallowed fragrance through generations yet to come; and the noble work they accomplished through a long series

of years to elevate and adorn their profession and to advance the interests of this Academy, and the great benefit they conferred upon humanity in preventing and alleviating human suffering, will ever be acknowledged and remembered, and their names will continue to be cherished, not only by us, their surviving friends and associates, but by their grateful patients both here and in distant States and lands, and by the dental profession everywhere.

Some of them had their peculiarities, so have we all; but I will venture the assertion that no future generation of dentists will ever find within their ranks twenty-six more able and faithful laborers, or twenty-six more true and honorable gentlemen. Quite a number of them lived to a very advanced age, and they left behind them a record and an example well worthy of imitation by the young men now coming into the profession. In their declining years they had the pleasant satisfaction of seeing the science and art of dentistry and the status of the profession advancing towards the ideal that they had formed for it in the thoughts and aspirations of their earlier years.

Having briefly alluded to the past history of this Academy, and spoken of the progress that has been made and the high ground that has been reached, let us leave the scenes of recollection for the survey of the field we occupy, and the prospect that opens beyond. At our monthly and annual meetings we meet to investigate every truth upon which our art is founded, that we may aid in its advancement, and be better qualified to fulfil our duties to our patients. We meet to compare notes, to exchange ideas, to learn from each other's experience, and to refute or confirm opinions previously entertained, and thus impart to one another and to the community in which we live, useful and practical knowledge.

We meet also to renew old acquaintances, and to draw more closely those fraternal bonds which should bind us to each other and to the profession we esteem. I say to the *profession*, because being conscious of our indebtedness to

it in the past, and the great progress it has made in our country, we should feel a pride in doing all we can to maintain its present prestige, and press forward to a still higher position.

One of my dear old teachers, the late Prof. P. H. Austen, in a valedictory address to the graduates of the Baltimore College of Dental Surgery, in 1853, used the following beautiful and impressive language :

“A man may redeem the follies of his youth ; a science correct the mistakes of its infancy. The arts of medicine and surgery have thrown over the ignorance and misconduct of their youthful days a thick veil of noble deeds, lofty aims, profound learning, and heroic self-devotion. If to the art of dentistry, youngest in this noble band of three, that stand to minister at the altar of suffering humanity, there still clings some of the reproach of her early associations, it is not because she is more lowly born than they. The deeds of her childhood might well be the boast of riper years ; they give sure promise of a maturity of which her elder sisters shall have full reason to be proud. Now, in the broad twilight of the present, to make the darkness of the past forgotten in the brightness of the future, and increase onward and upward till it shall reach the fullness of noonday splendor—this, gentlemen, is your mission.”

The prophetic utterances of Dr. Austen, made thirty-two years ago in Baltimore, are being fulfilled. Since that time, dental colleges and dental schools in universities have been established in different parts of our country, and dental societies have been instituted in every State of our Union, and also in Europe—and all these in the aggregate have done a mighty work in the education and elevation of the profession. The standard of general dental practice has improved at least fifty per cent. since the organization of dental societies.

Associated effort for the accomplishment of any purpose is one of the greatest promoters of progress.

Dr. C. E. Francis, of New York, at one of our anniver-

sary meetings some years ago, very truly said, "That dental societies are the very backbone of the profession. It is at such gatherings that the members bring their best thoughts, and keep up the spirit that is inculcated at the colleges," The first dental society in America, and I may say in the world, was organized in New York City in 1840, as a national association, under the name of the American Society of Dental Surgeons. I am happy to be able to say that quite a number of the members of that old distinguished pioneer society became members of this Academy—a few of them still survive—one of these seniors we rejoice to see present here to-day—a gentleman full of years and of honors, and one who took an active part in the formation of this Academy, and who has ever since favored us with his presence and words of good-cheer and encouragement at all of our annual meetings, and at most of our monthly meetings. I refer to one whom you all delight to honor, Dr. E. G. Tucker, of this city.

When I began the study of dentistry thirty-three years ago, there was not a dental society in the New England States, and but six in the whole United States. There were but two dental colleges actually in operation. Two others procured charters during that year. There are now twenty colleges and more than one hundred State and local societies and two national associations in our country alone. besides several valuable dental journals, issued monthly, and many standard text-books and scientific works upon the different branches of our art, published by able authors. Showing what remarkable progress has been made within the compass of half an ordinary life-time.

To New Hampshire belongs the honor of starting the first society of dentists in New England, which was organized at Concord in 1853, under the name of the New Hampshire Dental Society. In the fall of 1854 the Vermont Society of Dental Surgeons was organized at Montpelier. Ten years later, Boston awoke out of its long sleep, and started the Massachusetts Dental Society, in 1864, and elected for

its first president an old and eminent practitioner of this city, the late Dr. N. C. Keep, who continued his interest in that society up to the time of his decease. The Massachusetts Dental Society has done a good work for the profession and the community. It has passed through some vicissitudes, but it still lives.

During the past ten or twelve years two or three other societies have been formed, so that Boston is now well supplied. It seems to me that instead of dividing the forces so much, the wisest course for one of the younger societies to pursue would be to unite with the American Academy of Dental Science by a transfer of membership, and consolidate their forces and interests with ours. By adopting this plan, all would be mutually benefited; new life and new strength would be infused into this Society, and it will move onward, strong and progressive, towards a brilliant future.

As the reputation of a person is determined by his acts, so the reputation of a profession or a society is determined or established by its acts, and by the abilities and activities of its members. There is a great deal of ability here, among our members, and all we need is a little more earnestness and activity in the work of the society. It has been said that a man or a woman can become lazy mentally as well as physically. We should each do something to leave its imprint, either by excelling in what has been done, or by taking some advanced step. Devotion to our profession is the secret of success. Nothing great was ever achieved without enthusiasm. We should cultivate self-reliance, and have a strong and high appreciation of faith as to our own God-given powers, which will enable us to work as others work, learn as others learn, and succeed as the best. The poet spoke most truly when he said:

" Our doubts are traitors,
And make us lose the good we oft might win,
By fearing to attempt."

Our meetings afford an excellent opportunity for active work, and every member should regard it as a duty to pre-

sent his views upon the various subjects that may come up for discussion. Differences of opinion may exist, but their free expression, coupled with a kindness of consideration for those who differ, will advance instead of retarding the interests of science. All the professions and many of the principal occupations of the present day, have their associations for mutual improvement and benefit, and it well becomes our specialty to be not less active. And let us bear in mind that the members of the dental societies, acting in co-operation with the faculties of our dental colleges, are together, the educators of the future profession.

In the spirit of inquiry and investigation which prevails, it is gratifying to observe that enthusiasm is not permitted to run away with judgment in any particular branch, so that the members of these societies are for the most part adopting a more conservative mode of practice than that which prevailed fourteen or fifteen years ago, when hard gold and mallet filling were talked up so loudly as the *only* practical methods. We thoroughly test the alleged modern improvements, many of which are truly valuable, and many are worthless, and we adopt only those that *prove* to be useful and practical, and save time and labor, while the rest we discard for a return to some of the methods the old fathers taught us which proved so eminently satisfactory during their long and successful experience in preserving the natural teeth.

Dental societies now exist in every State of our Union, and several have been organized in Europe.

"Thus the dental graduates of the colleges and the universities are getting into one vast associated fraternity, and establishing an efficient professional organization, with its policy adjusted in every direction to the cultivation of the science, and to the regulation of the conduct of the profession; thus forming a standard professional sentiment, and through its agency, raising public opinion into a supporting conformity."

As one of the senior members it may not be assuming

too much for me to suggest that the Academy be not too exclusive in the admission of new members. Our membership has increased very slowly during the past few years. This can be attributed mainly to a great lack of effort on the part of our members, myself included, to interest others and induce them to join the Academy. It is well to be cautious and choice in our associations with other practitioners, but not fastidious. During this coming year, let each one of us make a stronger effort to bring in some new members, and especially from among those who have recently graduated and are yet young in experience and practice, for to the young men we must look for the future progress and development of our profession, and the continuation and success of this Academy. In this way we shall render our meetings more interesting, and enlarge and improve our opportunities for doing good unto others.

There have been from time to time during past years; some practitioners, not many, who seem to chafe under the custom which prevails of being termed dentists, and a few have even advocated the dropping of the word *dentist* from our nomenclature, and substituting some other name. Various names have been suggested to take its place. In the earlier years the phrases surgeon dentist, surgical and mechanical dentist, were sometimes used—in later years operative and mechanical dentist, and the words dentician, dentificier, dentologist, oral surgeon, oralist and orist, have been suggested and by some used. Now the question is which one shall the profession adopt, and have registered in the new dictionary of the future.

As the word dentist came so honestly from the Latin word *dens*—a tooth, and is so universally used at the present day, it seems to me that the only course to pursue is to continue the term *dentist*, and let the profession through its proper representatives, communicate with lexicographers, and prevail upon them to give in their future editions of dictionaries a more extended and comprehensive *definition* of the word than they have in the past.

The definition given in Harris's *Dictionary of Dental Science* is good, viz.: "One who devotes himself to the study and treatment of diseases of the teeth and their connections, and which at the same time embraces the prosthesis, or replacement of the loss of these organs, with artificial substitutes." In speaking upon this topic, Dr. Austen said, "We do not say surgical aurist or ocular surgeon, for the aurist and the oculist treat the medical as well as surgical diseases of their respective organs; therefore to him who must bring medical, surgical, and mechanical skill into such constant and harmonious exercise as our profession, our specialty, requires, that term is most appropriate which will at once express all its duties. This you will find in the comprehensive name Dentist. I would then advocate the discarding of all phrases of partial significance, and let this be the name which it shall be our delight to honor. Let us put away from us any insinuation of inferiority which would be implied by prefixing to it or substituting for it any other term, and acknowledge the right of none to its adoption, who are not qualified in all that it comprehends."

I appreciate the high motives of those gentlemen who advocate the terms oral surgeon and oral science in the place of dentist and dental science. They do so because so many of the followers of our art have degraded the profession, and brought a reproach upon the name of dentist by their ignorance and malpractice, which has caused many men of science and education in other professions to place a low estimate upon dental practitioners generally—but the community is becoming more enlightened, and is beginning to discern between the educated and the uneducated dentist, and to discriminate between the true and false, the scientific and the pretender.

If we drop out the term dentist, then we shall be obliged to drop all words of a kindred nature which have the same derivation, viz: dentistry, dental surgery, dental medicine, dentition, dentation, denticulate, dentiform, dentoid, denture, and some others, necessitating a complete change in our

dental vocabulary. I trust those gentlemen who proposed this change, and who continue to advocate it, will yet be convinced of its utter impracticability. Like the dental profession, the ranks of the medical profession are infested with charlatans, but we never hear of their advocating the discontinuance of the term physician because of its free use by the class mentioned. Let us then retain our title of dentists, and each one strive to elevate it, and we need not fear that the name will degrade us. Our profession is rapidly redeeming the past, and proving her right to a high seat among the sciences, which she claims. Men whose talent and education would adorn any calling, she now numbers by hundreds, and I might say thousands.

A few words in regard to maintaining the dental laboratory. There are some, not many, who are inclined to exclude from the list of essential duties such as are in any wise mechanical. They seem to view the laboratory work, the making of artificial teeth and plates, as too mechanical, and therefore somewhat degrading, now if the exercise of mechanical skill is degrading, then our whole art must be so, for nearly all of our operations depend for success upon this same species of skill. Is it a higher order of work to extract a tooth than to replace one? I admit that handling gold-foil and saving the natural teeth may be an operation of more importance to our patients in the aggregate than making and fitting artificial teeth, which restore to the denuded arch beauty and usefulness—but are they not both honorable operations, often requiring the highest skill and ingenuity? Newton made the telescope, Fahrenheit the thermometer, Angelo the statue, Raphaël the landscape. "When the brush of the painter or the chisel of the sculptor shall be thought to tarnish the genius that hides them; then, but only then, may we look down on the tools where-with we must work out the high and useful purposes of our art." Because the laboratory work has not of late years kept pace with the improvements in operative dentistry, but has been degraded down by poor work and cheap prices,

and is to a great extent in the hands of the unscrupulous and unskillful, we *should not forsake* this department of our art, but take a stronger hold of it, rescue it, and raise it up again to the respectable place it once occupied.

Let us then maintain our laboratories as indispensable adjuncts to our operating rooms, and teach our students the use of tools as well as instruments, and how to use the dentists' lathe as well as the dental engine, how to restore the human face divine as well as how to preserve the natural teeth. Let the office and laboratory go on kindly together, with no idea of a separation, or a divorce, as some have advocated.

Times will not permit, neither would it be advisable in an address upon an occasion like this, to enter into any special discussion of the effects of food and drink upon the teeth; but I would like to call your attention to an able paper upon "Man and his Teeth," written by Dr. E. W. Foster, of this Academy, and published in the *Dental Cosmos*, Volume 18, wherein he speaks of the influence the water we drink has upon the teeth. And I would here say that my experience and observation during my long practice as a dentist, enables me to fully coincide with the views of Dr. Foster on this subject. It is necessary that the whole paper should be read in order to get at an intelligent understanding, or a fair estimate of the points he has there so well presented and proved. I can give here only a short extract from the paper. He says:

"Water has an almost inestimable influence on the teeth as well as upon the rest of the body. In fact, we have data to prove that children having plenty of water called 'hard water'—*that* water holding in solution a greater proportion of nutritive salts than the so-called 'soft water,' will have good teeth almost invariably; while our modern systems of water-works of lake and river water evaporated in reservoirs, and holding much organic matter in solution, and also the system which prevails to a large and increasing extent in many of our interior towns, of building tanks or cisterns

in cellars to catch rain-water for drinking purposes, and in each case being 'soft water,' will have, as in the nature of the article supplied, sooner or later, a pernicious influence on the teeth of those compelled to use it for food and drink.

"The Old Oaken Bucket is not alone a sentimental myth, but a practical reality. And the old well-sweep of our boyhood, or the clear, hard water spring from the hill-side that gave its priceless supply to the bony and dental systems of its partakers; that water so healthful and relishing, that has inspired so much genuine poetry and reflection, and that has such life-giving power and so beautifully reminds us of that 'well of water which springeth up into everlasting life,' is personally and intimately practical to us all.

"In a word, I would say 'hard water' for culinary and drinking purposes, and 'soft water' for washing and other uses. Water is Nature's universal food. It forms a large bulk of all we eat and drink, and is a large part of all we are ourselves. Here we see the most fluid and health-giving of all soft foods, furnished by nature herself; and I will show you the best teeth where the water for family use has been best for sustaining adult organization, and the growing wants of the young. And this water comes from old, deep, and mossy wells—wells holding in their clear cold depths the solution of certain metallic riches of the earth, riches that man must have, and that nature here so kindly and sagaciously provides. Or, again, the springs by the wayside, into whose tiny basin a liquor fit for immortals is distilled from rock mountain sides, and nature says to man: 'Drink, O mortal traveler; then pursue thy way with strong limb and purpose, cast a smile upwards to thy ancient mother, and let the light of thy face pale before the iridescent glow of thy fair and beautiful teeth.' In early childhood, milk, another fluid food of the most vital importance, rears and develops the teeth. Air, light, and happy thoughts, and rays of hope and laughter, and good fellowship, are also foods for the teeth."

And now lastly, but not least, I desire, gentlemen, to call your attention to a subject in which I have of late taken a deep interest. I refer to the new dispensation in the healing art, or I might say the ancient practice revived, of Metaphysical Healing or Christian Science; a subject that is destined as it shall become known and understood to be of great benefit to the race, and one that is to be of mighty importance to our profession in the future, in allaying the *fears* and *pains* of our patients while undergoing operations in dentistry, and in preventing any unfavorable after effects, and also in preparing them for the operation by removing or lessening the *dread* which most persons feel when contemplating a visit to their dentist. The understanding of this science will also enable us as dentists to operate with greater ease and less personal fatigue, which is an important consideration to us in the laborious and wearisome vocation of the dental practitioner, often so exhausting to the nervous system. You are doubtless aware that this subject is attracting much attention in this community, and in other portions of our country at the present time, and also in England, where it is causing a very spirited and even acrimonious discussion. It is a noteworthy fact that two societies have been recently organized to investigate, in general terms, the influence of Mind in Nature—one called the English Society of Psychological Research, and the other the American Society of Psychological Research. These societies embrace within their membership many eminent names in scientific and philosophical circles in Great Britain and the United States. In the *Dental Cosmos* I observed a notice of a work recently published, entitled *Illustrations of the Influence of the Mind upon the Body in Health and Disease, Designed to Elucidate the Action of the Imagination*, by Daniel Hack Tuke, M. D., L. L. D., Fellow of the Royal College of Physicians, London. In this volume, containing four hundred and eighty-two pages, the author, taking as his text the saying of John Hunter, "There is not a natural action in the body

whether involuntary or voluntary, that may not be influenced by the peculiar state of the mind at the time," has formulated the generally accepted facts of physiology and psychology as they bear on the question of the influence of the mind upon the body. He has collected into one volume, from all sources at his command, authenticated facts illustrative of this influence, and supplemented them by instances which have come under his own observation. This is considered a superb work, and should be in the library of every dental practitioner.

In a recent discourse upon the Mind Cure, delivered by the Rev. Dr. C. A. Bartol, which has since been published in pamphlet form, he said: "In using the terms *Metaphysical* or *Christian Science*, the new practice disowns aught magical or lawless in its belief or procedure, appeals to common sense and common experience to attest its claims, and plants itself upon the base the Bible builds on, fact and principle in human nature; not despising but confirming God's recorded or unwritten revelation, coming like Christ, not to destroy but to fulfil." What a beautiful tribute to this science from one of Boston's oldest and most learned divines. He further said: "The attenuation of medicine which has worked so well may end in its annihilation," and he "greeted the new departure which lays the stress on mind," and adds, "let us not with cast-iron prejudice reject whatever agrees not with our prepossessions."

During the past three years I have devoted considerable time to the investigation of this science. And it may be truly designated a *science*, for it is founded on a principle that can be demonstrated and proven. The power of mind over the body is as yet but little known and understood. Dr. Arthur T. Buswell, Christian Scientist, of Boston, in a recent communication to the press upon *Metaphysical Healing* said; "Probably no subject of reform has received so much able thought in both the old and new world, as the relation of science to religion; but hitherto

the sanative and reformatory qualities of Divine Truth and Love have been practically excluded as intelligent remedial agents, by the doctors of both mind and body."

There has been much written upon the Science of Mind or Soul, and the Divine Law of Cure, and on Mental Healing, Faith Cure, Mind Cure, and Mental Medicine, and some of them are works of excellent merit; but from quite an extended examination and research and inquiry, I find that the science and laws of purely mental healing and their method of application through spiritual power alone, were discovered and brought out to this age by a Woman—a lady of rare intelligence and refinement, and of high Christian character, Mrs. Mary Baker G. Eddy, now President and leading Professor of the Massachusetts Metaphysical College, 571 Columbus Avenue, in this city. This institution was regularly chartered by the Legislature of Massachusetts in 1881, under Governor Long's administration, and as set forth in the annual announcement: "Male and female students are here taught metaphysics on a purely practical basis, to unfold the resources of unfathomed mind, to impart a thorough understanding of mental science, to restore and preserve health, and to elevate man physically, morally, and spiritually, and thus restore to the race hope, health, and the lost science of Divine or Christian Healing."

This is the first legally founded and the only thoroughly metaphysical college in the world. It has a powerful ally in the Christian Scientists' Association, a large and influential organization, whose membership is made up of graduates of the College, actively engaged in healing; an earnest band pledged and working together in a common cause of humanity and love. This Association is the only body of organized metaphysicians in the world.

The following account of the circumstances through which Mrs. Eddy discovered this principle of healing and the metaphysical science that governed it, is taken from the *Christian Science Journal*, a monthly magazine pub-

lished by the Association, and the narrative is replete with interest :

"Some eighteen years ago this woman, who was a practising homeopathic physician, had her attention called to the great influence which the minds of her patients exercised over their bodily condition. She was a thoughtful woman with an independent and original mind, which could not be limited to the conclusions of other minds. Following this line of investigation thus indicated, experimenting with doses of pure water, when a favorite remedy was expected by the patient, and gaining exactly the desired result; in other cases bringing her mind to bear on the disease, and restoring the patient to health, unaided by drugs or the imagination, she gradually became convinced that the power of mind over matter was an almost undiscovered and a wholly incalculable force. Later, she received injuries by an accident which her attending physician and surgeon pronounced fatal, and said she could not survive over three days. Her limbs were paralyzed, and her suffering great. The third day was the Sabbath; her clergyman visited her before services, prayed with her, and said farewell. She asked him to call after meeting. He replied by asking her if she knew the fatal nature of her injury, and that she was sinking, and might not survive through the day. She replied that she knew it all, but had such faith in God she thought he would raise her up. After he left, she requested to be left alone; the room was full of people, but they all passed out. She then gave her mind intently to the New Testament account of Jesus' healing the withered hand on the Sabbath day. As she read, suddenly a great change came over her; her cold, immovable limbs became warm and full of life, the internal agony ceased, her strength came instantaneously, and she arose from her bed and stood upon her feet, a well woman. The clergyman called after services, and she met him at the door, and that day prepared the evening meal for the family. Both her clergyman and physician were astounded

at her recovery. There are persons living who can attest to the above facts.

"She says; 'For three years after this, I sought day and night for the solution of the problem, How was I cured? I searched the Scriptures, reading nothing else, not even a newspaper—kept aloof from society, and devoted all my time and energies to discovering a rule for that demonstration. I knew its principle was God, and thought it was done according to primitive Christian Healing by a certain action of mind on the body, through a holy, uplifting faith; but I wanted to find the science that governed it, and by the help of God and no human aid I did find it.'"

This she claims to have discovered and to have demonstrated by the healing of hundreds of people, many of whom have been pronounced incurable by the best physicians.

Mrs. Eddy has labored with tongue and pen to found this system, and for the last sixteen years has taught this theory to others in so far as their minds were capable of receiving. She has printed and published two volumes, entitled *Science and Health with a Key to the Scriptures*—in which the principle underlying this science is explained. This is the most remarkable book on Health and Mental Healing that has ever been placed before the public. It is having a great sale, and has already reached the twelfth edition. The author claims that the methods of healing which she has introduced to this age, are those of Christ and His Apostles. Jesus commanded his disciples to "Go into all the world and preach the gospel and heal the sick." This divine command is just as binding upon Christ's ministers and disciples of to-day as it was in the days of the Apostles. He also told them: "He that believeth on me, the works that I do shall he do also; and greater works than these shall he do, because I go unto my Father."

"And these *signs* shall follow them that believe; in my name shall they cast out devils; they shall speak with new tongues;

"They shall take up serpents; and if they drink any deadly thing it shall not hurt them; they shall lay hands on the sick, and they shall recover."

Mrs. Eddy says the principle of Mental Healing is Divine and Eternal; but the application of it to heal the sick has been lost sight of, and required to be again spiritually discerned and its science discovered; that men might retain it through the understanding. She begins her book on Science and Health as follows: "At the Oxford University, England, a prize of one hundred pounds has been offered for the best essay on Natural Science that refutes the tendency to attribute physical effects to physical causes rather than a final spiritual cause.

"A demand for metaphysics expresses the wants of the race. It is the one question to be considered, for it relates more intimately than all others to the progress of mankind. The age seems ready to verge upon this subject, to think briefly on the supremacy of spirit, and to touch the hem of its garment and be made whole. The utter control of mind over body is no longer a question with us; we have gained its proof by demonstration, and have reduced our discoveries to a system, stated the principle upon which it is based, and the rules for applying metaphysics to the treatment of disease.

"After a careful examination of the discovery in metaphysics that mind governs the body not in part but wholly, we submitted our metaphysical system of treating disease to the broadest practical proof. Our theory has gradually gained ground, and established its own proof whenever it has been employed honestly and under circumstances that permitted its demonstration, as the most effectual curative agent in medical practice.

"As time is working wonders in the world we call material, the swift pinions of thought are soaring to the realm of the real, the first cause of all things. A material basis whence to deduce all that is deemed rational is yielding slowly to a metaphysical basis of reasoning, changing

from matter to mind to discover cause and explain effect. The honored materialistic philosophers, Professors Tyndall, Huxley, Agassiz, and others, appear to challenge to final combat physics and metaphysics; and at this Utopian period, like the shepherd-boy with his sling, woman goes to battle with Goliath."

The power of mortal mind over its own body is great, its action to destroy the body, reversed, will restore health. John Hunter, the great surgeon and anatomist, said: "As the state of the mind is capable of producing a disease, another state of it may effect a cure."

A. Bronson Alcott, after perusing the books, *Science and Health*, wrote the author as follows: "The profound truths which you announce, sustained by facts of the immortal life, give to your work the seal of inspiration—reaffirm in modern phrase the Christian revelations. In times like these, so sunk in sensualism, I hail with joy your voice, speaking an assured word for God and immortality, and my joy is heightened that these words are of woman's divinings."

Many persons, and among them several of my acquaintance, have recovered their health from reading these books. All science must be thoroughly taught to be understood, and understood to be demonstrated—so you may not at first accept all the statements and conclusions found in these volumes, and you cannot fully understand them without further explanations and personal instructions from the author, who is eminently qualified as a teacher, and possesses a remarkable faculty of imparting her knowledge to her students. I believe she has been selected for this high mission, as the one from among all the millions, because of her peculiar fitness for this grand work of leading the way, and introducing this great subject to this age and to the world. Hundreds of hopeless invalids are constantly being restored to health by her methods, and many dissipated, degraded men and women are being brought to lives of sobriety and virtue. For this science not only

heals the sick but reforms the sinner at the same time ; so we can but give praise and God-speed to this noble work which as it shall become known and understood must prove of untold benefit to this and future generations.

Since the opening of the college mentioned, and during the previous years that Mrs. Eddy has been engaged in teaching this science, nearly one thousand students have availed themselves of her system of instruction. Some of them have studied merely for the benefit of their own health and that of their families, but most of them are now engaged in practising this new art of healing as a profession, in this and in other portions of our country. They practice under the title of C. S., Christian Scientist, and they employ neither drugs, magnetism, manipulation, nor will-power, and are strongly opposed to the notions of modern Spiritualists, and are unbelievers in clairvoyance. Their fundamental ideas are that all substance is spirit, and Spirit is God, that man is God's idea, and hence he is immortal—that good is eternal, evil an unreality, and the punishment for sin is limited and remedial. Spirit is God, and God created man in his own image and likeness ; hence, man is spiritual and not material. God did not create sin, sickness or death. Whatever is of God's creation is good—God is Life, Truth, Love and Harmony. The *unreality* of evil, whether sin, sickness, sorrow, or death, is one of their strong points in healing the sick. They take the opposite thought to what their patients believe through their personal senses. They treat error with Truth, discord with Harmony. Good is the opposite to evil—Good is the real, evil the unreal. Health is the opposite to sickness and opposite to death, Harmony is the opposite to discord—Sorrow is not the master of joy—Joy is the real, and is the stronger power, and must overcome sorrow. Fear is not the master of Courage—Courage is the stronger power and must conquer fear. It is the *fear* of sickness or disease, either in the conscious or unconscious thought, that brings it out through the mortal mind upon the body.

Dr. Bartol, in the discourse before alluded to, quotes thus: "The matter with you, said one of the Mind Curers to her patients, is vipers; envy, malice, jealousy, suspicion, corroding cares, over which you are brooding in sadness. Is it not as fine a miracle to cast out these as to expel unclean spirits in the country of the Gadarenes? Was Christ's prediction false of the greater works His disciples should do?" All the drugs in the pharmacopœia could not help these cases, but through *mental* treatment many such have been cured, and thousands upon thousands more will be in the future. The question has been asked in the past, who can minister to minds diseased? I answer, the Christian Scientists. They displace images of terror with pictures of hope, and their patients are healed. What a glorious mission is theirs to alleviate and prevent human suffering! I have received a course of instruction at the institution spoken of, and frequently attend the meetings and lectures of the Scientists, and my interest in the subject increases. I have made some progress in the demonstration of this great principle in my dental practice, and shall be able to accomplish much more in the future as I acquire a higher understanding of its power. And I would recommend my fellow-members in this Academy to obtain the books, *Science and Health*, and study and examine into this Truth, and also avail themselves of a course of instruction at the Massachusetts Metaphysical College.

It is very easy and natural for a person to feel prejudiced against what they do not understand, but by giving your attention to the study and investigation of this subject, you may discover, as I have, pearls of great price. This science will of course meet with such opposition, as all great reforms always have in the past. But its destiny is onward. This is an age of progress and free thought. A new era of light is just dawning on the land. Cure by the administration of mixtures and boluses is so long an established custom and tradition, that it is only very slowly that the world will give it up. The custom so prevalent

of pouring out so much sympathy over those afflicted with illness, is debilitating in effect, and retards their recovery.

Metaphysical Science instead of coddling and encouraging sickness, meets it with an infusion of vigor and energy, and the patient is inspired with a *determination* to get well. It is proverbial that persons who read medical works much are always ailing. The numberless patent nostrums that are so extensively advertised, and the descriptions of diseases by quacks and clairvoyants, are a very prolific modern source of sickness; and the *public* exhibition of monstrosities and disgusting morbid specimens in museums of anatomy, should be prohibited by law. The thoughts should dwell on the good and the beautiful; on objects of health and harmony, instead of disease and deformity. As if not satisfied with the ghastly array of diseases already recorded by the medical fraternity, they are continually discovering new diseases, and announcing new names for them through the daily press, books, and journals; and new drugs and specifics are brought out almost daily, and heralded throughout the land, attracting the attention of the people, picturing to their minds and forming in their thoughts images and fears of these diseases, and the result is very many become afflicted with them who might otherwise escape. Let health be more contagious than disease. In the olden times, in the days of our great grandfathers, who ever heard of dyspepsia, spino-meningitis, hay-fever and rose-fever?

"The best receipt for health, say what they will,
Is never to suppose we shall be ill;
Most of the evils we poor mortals know,
From doctors and imagination flow."

You have known me through many years, especially the senior members, as a very conservative man in religion, politics, and dental practice, and one not easily led into side issues, and when I began the study of this science, I felt doubtful whether the claims made for it could be fully demonstrated and sustained; but as I have watched very

closely the progress of the Christian Scientists during the past three years, and have felt personally the power of this Truth in the great benefits I have received in my own health, both mentally and physically, and have noticed from time to time the large number of people that have been permanently healed of their diseases, and restored to health and happiness through the beneficent efforts of these mental physicians, and have known of some remarkable cures among my own personal friends and acquaintances, I can but feel fully convinced of the genuine worth and power of this method of healing.

I have made a few notes from time to time of some of my demonstrations upon my own patients in dentistry, and at a future meeting of the Academy, I will present a paper giving you the results of my experience. I will merely say to you now, that my efforts thus far have been rewarded with a sufficient degree of success to enable me to state that I fully believe the time will yet arrive when the intelligent application of metaphysical treatments to our patients by honorable practitioners educated in this science, will prove to be of great practical service and benefit, and perhaps more so than any other anodyne or anæsthetic which has ever been used or discovered.

The Science of Mental Healing, as it becomes known and understood and intelligently applied in daily life, will not only promote physical health, but will exert a highly beneficial influence on the mind, and it is destined to have a powerful influence for good upon this and future generations; not only in healing the people of their bodily diseases and infirmities, but also in curing them of their mental ills, and bringing about an improved condition of health and morals, and increasing the longevity of the race. Even those who are in good health would do well to study this science, and induce their children to study it, so that all may learn how to *continue* in good health, and attain to a ripe old age.

I will now close with the earnest hope that this Acad-

emy will continue to grow and thrive and bring forth much fruit, and that the younger members, upon whose shoulders the carrying on of the good work is now placed, will continue their interest, and put forth their best exertions for its future welfare and progress, that as the years roll on, they will be able to rear a beautiful superstructure upon the good foundation that has been laid.

ARTICLE II.

RIGGS'S DISEASE.

BY G. A. MILLS.

At a meeting of the Connecticut Valley Dental Association, about eighteen years ago, at Northampton, Mass., John M. Riggs, M. D., of Hartford, Conn., was invited to make a proclamation (associated with a clinic) of his views concerning a diseased condition of the gums and the sockets of the teeth which often causes the loosening and falling out of the same. Up to this time nothing had appeared in the literature of dentistry except that which classed this disorder among the incurables, and it was spoken of as the result of senility; hence the common remark among people, "My father's and mother's teeth all dropped out, and it is only a matter of time with me." The removal of tartar as an external deposit upon the teeth was classed simply as an operation of scaling. This operation only recognized the foreign matter that could be seen. Dr. Riggs, in announcing his original views—while he gave it as his opinion that the deposits of tartar were the cause of the disorder under consideration—stated that his observation and experience matured the knowledge that there was a decided progressive inflammation existing under the gums and wasting both the

hard and soft tissues, so that their attachments with the roots were gradually being destroyed. His knowledge of surgical principles suggested a practical application to these diseased localities, and he proceeded to the removal of all foreign substances from the roots of teeth, and the trimming of the necrosed edge of the alveolus to the life-line, leaving nature to restore to a normal condition. Dr. Riggs's views naturally excited a variety of comment—some expressing disbelief, and others accepting his novel ideas and statements. Not a few denied the existence of a necrosed edge of the alveolus. Dr. Riggs had devised a set of instruments well adapted for the treatment of this disorder—and these were unique and new, yet there was an effort on the part of a very few to dispute his claim to this invention; this did not prove a success. This body (the Connecticut Valley Dental Association) subsequently passed a resolution giving credit to Dr. Riggs for originality relative to the new pathology of the disorder now termed Riggs's disease, and so named at about that time in honor of Dr. Riggs. I have previously remarked that nothing of the doctor's views had ever been published so far as known. But—having become personally much interested in this disease, and in the discussion of it, and also finding my position regarding it misunderstood by several dentists—I was led to prepare a series of articles (six), which were published in the "Dental Cosmos" during the years 1876 and 1877, under the title of "What I know about Riggs's Disease," in one of which articles I challenged the record of views corresponding to Dr. Riggs's. Since then not a word has come from any source to show that he is antedated in the matter. I may add that a confirmation of his views and their acceptance by many members of the dental profession have gradually taken place. I am glad to say that to-day it is the most prominent subject for consideration before dentists generally. Only a limited number, however, have come to a correct understanding of what is required and how to meet the requirements. These few are demonstrating a successful treatment

of the disorder. At this point of my article it seems advisable to introduce a feature which I shall elaborate later on; it is in reference to the technical term by which this disorder is now known—viz., *pericementitis*, substituted for the term well known by medical men—dental periostitis—meaning inflammation of the dental periosteum. This term (*pericementitis*) originated in the laboratory of Charles Heitzman, M. D., of New York city, during the late investigations made there by dentists under his instruction. The general subject of *pericementitis* it is not my design to discuss here, but it is necessary to make the distinction clear between Riggs's disease and general *pericementitis*. Riggs's disease is a peculiar phase of *pericementitis*; it may exist to the final loss of all the teeth, without a sign of any other phase of this disorder.

As the nature of this disease is so plainly embodied in my brief history of the matter which includes its pathology, it would seem that my readers need not be ignorant to its main features; therefore I pass to consider the diagnosis.

To diagnosticate an incipient case, or first manifestation, as it is often seen in the mouths of children (even at a very early age): The simplest form of the disease may often be seen at the peripheral part of the festoon of the gum tissue indicated by a congested appearance; by lifting this gum with a delicate instrument, there will be seen a little seed-like granule of calcific substance. Another case might show a deep red and raw-looking, elongated appearance of the gum-tissue about the necks of the teeth, and with or without any deposit; there may be also a looseness of the gum about the teeth, which causes quite a pocket. This latter condition is often a sequela of exanthematous disorders. The gums are often extremely sensitive to the touch. In the various cases we find general congestion, easy hemorrhage, pale and bloodless gums, a decidedly anæmic and frequently pimpled surface of the gums—the latter appearance in adults. Not uncommonly a first

warning to the patient (adult) will be pain or tenderness about the tooth or teeth, and an examination will not reveal any decay, death of pulp (commonly called nerve), or evidence of inflammation of pulp. This is what I shall term a subtle manifestation, for it has been believed there could be no inflammation of the dental membrane without a disturbance of the pulp. This is now proved to be untrue, for abscesses do occur while the pulp remains normal. In a large proportion of cases there will be, on light pressure, a flow of pus from under the gums, and oftentimes it is a copious discharge. This may be general, or it may be confined to a single tooth. Looseness of one or more of the teeth may be observed; also malposition, and this commonly after an occluding tooth is lost. I have given in detail enough of the manifestations to lead one even superficially familiar with unhealthy conditions to the diagnosis. It will be observed that I have omitted other conditions of disease that are manifested in the mouth, associated with the teeth and allied structures—viz.: syphilis, salivation, and scurvy. While in some instances these may be separated from the disorder in question, yet they are sometimes complications. I will mention another marked diagnostic feature associated always with an active stage of the disorder, and that is the odor which is distinctly noticeable to one familiar with Riggs's disease. There are other local manifestations that are, without doubt, largely influenced by the disease, but are commonly classed as expressions of constitutional debility, and still they may be wholly the result of the disorder under definition. This is proved by the arresting of the disease when the disabilities referred to are removed. Recession of gum-tissue is often seen, and no apparent inflammatory condition. While this is a peculiar phase, I maintain it is the same disorder. My term for it is atrophy of the gum-tissue—erosion of the tooth-structure, causing grooves across and around the necks of the teeth, not infrequently taking a serpentine direction. This also is a manifestation of the same disorder, as it is arrested by the treatment which will now be described.

TREATMENT.—As the nature of the disorder has proved to be novel, so will the treatment appear, as Dr. Riggs was the inventor of a set of instruments with which to perform the operations required in treating the disease. Each one is six inches in length, including the handle, which is of ebony and steel, octagonal and tapered; the blades are seven-eighths of an inch long, bent at an obtuse angle. The instruments are in two pairs, and there are two single ones. One pair has a knife edge and a safe edge; the other pair has the same, but these are reversed in their bevels—made so for the purpose of working at a different angle of the mouth, and from the operator instead of toward him. The single ones are double knife-edged, and differing in thickness of blade. Perhaps no better idea can be given of the general form of the blades than to say they resemble the half of a snipe's bill, the long, ovoid point being particularly adapted to ferreting out the intricate and deep-seated disordered parts of the hard and soft tissues about the roots of the teeth. In their dimensions they may seem ponderous to a novice, but in the hands of an expert no instrument can be more efficiently and delicately used. It must now be seen, by the description and location of Dr. Riggs's disease, that most of the operation is under the gum-tissue and out of sight, so that necessarily to know when the operation is complete at a given point can only be accomplished by an acquired and acute sense of touch. It may be said that the Riggs's treatment has instituted a distinct and systematic mode of arresting the disease. Rightly understood and rightly practiced, I regard this treatment as the most efficient in dental surgery. The severity of the cases differs according to constitutional conditions, and, if the dentist is the doctor, he will know whether the patient can be wisely aided by constitutional treatment. The prognosis must be based upon the conditions as they appear in each case.

From an extensive experience within the last ten years in the treatment of a large number of cases, and the success attained, I am justified in saying that Riggs's disease can

no longer be classed among the incurable ones.

It is perfectly plain that this disease is not confined to any one period in life. Under the age of forty I have had numerous cases in the most active stages of progress—so noticeable that there was almost spontaneous hemorrhage of the gums, and such an excessive flow of pus that the service of napkins for absorbing was required in sleeping hours. These facts can be testified to by well-known physicians. As one impressed with the prevalence of Riggs's disease, and its destructive effect on the general health, I should be remiss in duty if I were silent, or neglected to call the earnest attention of medical men and the public to the grave facts, for they have had too little consideration. I would say emphatically that the most serious complications may arise, and the worst septic conditions may be threatened and encountered, from pure neglect. That one disorder not arrested calls others of a more serious nature into existence is a well-known fact among medical men.—*New York Med. Journal.*

ARTICLE III.

A GERMAN TRIAL AGAINST DENTISTS FOR
USING THE TITLE "DOCTOR OF
DENTAL SURGERY."

[Translated for AMERICAN JOURNAL OF DENTAL SCIENCE.]

BY GEORGE C. GASTON.

IN THE NAME OF THE KING!

In the suit against the dentists, Dr. Schunk & Company, (Dr. Spahn), both at Frankfort-on-the-Main, for offense against the Industrial Ordinance.

The first instance of the Royal County Court, of

Frankfort-on-the-Main, has decided in a sitting of the court on June 15th, 1885, which was participated in by Dr. Koerner, President of the County Court; Dr. Kienitz, Fechner, Associate Judges of the County Court; Dove, County Judge; Brodman, Assistant Judge, as judges; Frehsee, Chief States Attorney, representing the State; Auerbach, as Court Stenographer.

On the appeal of the Royal States Attorney against the decision of the Royal City Court, of Frankfort-on-the-Main, dated April 16th and May 7th, 1885, that the accused: Dentist, Christian Carl Schunk, born on the 27th of September, 1847, at Buedingen, (Protestant); Dentist, George Stuckert, born May 4th, 1845, at Groskarben, (Protestant); Dentist, Valentine Schmidt, born December 7th, 1846, at Eppingen, in Baiden, (Catholic); Dentist, Oscar Wendler, born November 24th, 1857, at Berlin, (Protestant); Dentist, Michael Joseph Spahn, born January 2nd, 1848, at Carlstadt, (Catholic); all residing at Frankfort-on-the-Main, are guilty of a violation of §147—No. 3—of the Industrial Ordinance, and are sentenced to a fine of 15 marks and costs, for which, in case of inability to pay, one day's confinement to be substituted for each 5 marks.

By judgment of the Royal City Court, of the 16th of April, 1885, the defendants Schunk, Stuckert, Schmidt and Wendler, and by judgment of the same court, May 7th, 1885, the defendant Spahn, have been found not guilty and acquitted of a violation of §147—No. 3—of the Industrial Ordinance. The Royal States Attorney took appeal from both of these decisions by brief, within the time allowed by law, on the 16th and 17th of April, and 7th and 9th of May, basing his appeal on the State Process Ordinance §§154-355-358.

Both decisions, being nearly of the same tenor and both being defendant mainly on the same points of law, and the appeal in both cases being homogenous, the court has ordered, according to §236 of the State Process Ordinance, that both cases be taken up jointly.

The defendants and Counsellor-at-Law, Dr. Geiger, as legal representative of defendant Spahn, have admitted, in accordance with the facts stated by the judge of the first instance, that they have designated themselves in newspaper advertisements and on business signs, as "Doctors of Dental Surgery," but do not consider themselves to have violated the law, having appended an explanation to the above advertisements, removing any impression of having received their degree in this country, this explanation consists in the cases of Schunk, Stuckert, Schmidt and Wender in these words: "Graduated in America," respectively "Graduated in New York," Schunk and Schmidt abbreviating these words in the following manner: "Gr'd't in Amer.," while Spahn's advertisement in the *General Anzeiger* reads "American Doctor of Dental Surgery."

§147—No. 3 of the revised Industrial Ordinance, which the State considers violated by the action of the defendant's, holds everybody liable who, not having passed the state examination, designate themselves as "Doctor," (Surgeon, Oculist, Accoucheur, Dentist, Veterinary Surgeon), or using similar titles, by which the impression would be conveyed, that the so designated person had passed the required medical examination. In order to understand this law, the word "Graduation" must be defined as laid down in §29 of the Industrial Ordinance. In the regulation of the medical profession, &c., the right of an unrestricted following of a trade or profession, has not been set aside, as the proof of competence and fitness (with the sole exception of the profession of druggist) is not a condition *sine qua non*. But the law has awarded to those who pass an examination as required by the Ordinances of the Federal Council, a double privilege, first, by designating to such graduates certain official functions, (Circuit Veterinary Surgeon, Circuit Surgeon, &c.), and secondly, in allowing such graduates the use of certain titles which are regarded by the people as proof of having passed the examinations required by law. The titles Doctor, Surgeon,

Oculist, Accoucheur, Veterinary Surgeon have been fixed as such designations. §29 of the R. I. O. The laws of the United States do not conform with ours, as the *so-called* diplomas are not issued by a State authority, but by the purely private dental colleges.

The defense contends that by use of the words used in addition to the word "Dentist," a perfect and full explanation was made to the public, that their degree had been received in a foreign country and not in this State. But this cannot stand before the law, the defendants refer to the high state of dental technique in America, and this is a well-known fact, but they make a boast of having received their *so-called* "American degrees," as though the acquireance of a degree in this State was of no value whatever. If, however, the state of American dental technique is really of such a high order, then, surely very often dentists who have received their degree in Germany, would take another course in American colleges, and therefore the designation "American Dentist" may be construed as having received a degree in both countries, but apart from this the designation "Dentist" with or without explanatory additions, is contrary to law, the title "Dentist" as above stated, being a prerogative of those who have received a degree in this State, if used by others, is a deception of the public. The dental technique of America may be developed to the highest degree, but the *so-called* "American diploma" gives no guarantee that the graduate has followed the study diligently, not to say, has reached the highest perfection in it, and the traffic in totally worthless academical diplomas and titles, has also reached a very high degree in the United States of America, and therefore the law of this State requires that the possessors of such titles give a guarantee of their competency by proving to the authorities of this State, that they are equal to the standard required in this country. The question of the protection of foreign degrees can not be raised here, the question here is the protection of *home* degrees against

deception. The defendants may have come up to the standard of the *so-called* American degrees, but in using titles only intended for persons graduated in Germany, they intend to convey to the public mind the impression that they also belong to such a privileged class.

In regard to the facts, the court has come to the conclusion that the defendants were well aware of the fact that by using the title "Dentist" they committed a deception of the public, it must also be further taken into consideration that a controversy in professional circles in regard to the right of using the title "Dentist" has been going on for a long time, and that numerous convictions have taken place. Even if they believe that by the use of additional words, they could circumvent the law, and thereby, perhaps elude punishment; they were at least conscious of the fact that they were acting in *fraudem legis*, the knowledge of this fact cannot be denied by the defendant Spahn, who declares that he asked Police Justice Genolla, and was informed by him that the use of the title "American Dentist" was proper. But the fact of his making the inquiry was evidence in itself that he was in doubt of the legality of his making use of the same. The information received by him can only be regarded as the expression of the private opinion of the Official, and as such it carried in itself no protection for the defendant, the defendant's have *intentionally* committed an illegal act, and therefore they cannot be protected by the plea of a misunderstanding of the law.

The fact was proved that the defendants at Frankfort-on-the-Main have described themselves as dentists during the first 3 months of the year 1885, without having received the proper degrees. Judgment was given according to §147—No. 3 of the I. O. In pronouncing judgment it must be taken into consideration that these are the first cases of the kind before this court in this city and therefore they may be regarded as test cases, in consideration of the circumstances each defendant has to pay a fine of 15 marks,

(about 4 dollars), in case of inability to pay—one day's confinement for each 5 marks to be substituted.

Signed :

DR. KOERNER,

" v KIENITZ,

" FECHNER,

" DOVE,

" BRODMAN.

Witness :

PAEHLER,

Court Stenographer.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The National Association of Dental Examiners held its fourth session in Curtiss Hall, Minneapolis, Minn., commencing Tuesday, August 4, 1885. President J. Taft in the chair.

The following State boards were represented, the four last named being new members: Ohio, by J. Taft and H. A. Smith; Illinois, by Geo. H. Cushing, A. W. Harlan, and C. A. Kitchen; Pennsylvania, by E. T. Darby; Maryland, by T. S. Waters; Michigan, by G. R. Thomas and A. T. Metcalf; Louisiana, by Joseph Bauer; Indiana, by S. B. Brown; Iowa, by W. P. Dickinson, J. T. Abbott, J. Hardman, J. F. Sanborn, and E. E. Hughes; Dakota, by S. J. Hill; Kansas, by L. C. Wasson and Wm. Shirley; Wisconsin, by Edgar Palmer, C. C. Chittenden, B. G. Marcklein, E. C. French, and J. S. Reynolds; Minnesota, by S. T. Clements and G. V. I. Brown.

The following boards belonging to the association were not present: Vermont, New Jersey, Georgia, West Virginia, Mississippi, South Carolina and Kentucky.

The following resolutions were adopted:

Resolved, That this association most earnestly com-

mends the action of the Wisconsin and other State Boards of Dental Examiners, in refusing to accept the diplomas of the so-called Wisconsin Dental College located at Delavan, on the ground that it is not a reputable school, and recommends to all State boards to which the diplomas of that institution shall be offered that they likewise refuse them.

Resolved, As the sense of this association, that persons engaged in the study of dentistry and physicians practicing as such should not be considered eligible to registration as dentists.

Resolved, That this association recommends that all applicants holding diplomas from the Royal College of Dental Surgeons of Ontario be required to submit to examination before they are granted license to practice.

WHEREAS, The dental law of the State of Maryland seems to be restrictive in its character; it is the sense of this body that the dental profession of said State of Maryland should, at the next session of its Legislature, seek to cause said dental law be so amended as to be in harmony with the dental laws of the other States.

Resolved, That the secretary be instructed to forward a copy of the above resolution to the State Board of Dental Examiners of Maryland.

Resolved, That this association recommend all State Boards not to grant temporary licenses to first-course students, or any others, unless fully satisfied that such applicants have had at least two years of practical clinical instruction. Such applicants shall pass as well a proper theoretical examination.

The following officers were then elected for the ensuing year: J. Taft, president; T. S. Waters, vice-president; George H. Cushing, secretary and treasurer.

Adjourned to meet at the place to be selected for the next meeting of the American Dental Association, on the Monday preceding the meeting of that body.

Editorial, Etc.

THE NATIONAL ASSOCIATION OF COLLEGE FACULTIES.
—The following is a synopsis of the proceedings of this Association at their late meeting held in Chicago. The Faculty of the University of Maryland, believing that dental students should have all the advantages offered by dental schools during the entire two-session course, which the graded course adopted by this Association does not afford, as it restricts students to one session only in operative dentistry, has declined to join the organization :

Resolved, That applicants for admission to our senior classes from foreign countries shall be required to furnish, properly attested, evidence of study, of attendance on lectures, etc., the same as is required of the junior students, and to pass the intermediate examinations.

Resolved, That a preliminary examination be required for entrance to our dental colleges; such requirements shall include a good English education. In case of any applicant failing to pass a satisfactory preliminary examination, the other colleges of this Association may be informed of the fact.

Resolved, That a candidate for matriculation who presents a diploma from a reputable literary institution, or other evidence of literary qualification, shall be admitted without further examination.

Resolved, That for preliminary examinations we recommend the following questions :

1. Write your name in full.
2. Give date of birth? Day, Month, Year.

3. Where were you born? Town, County, State.
4. Where do you now reside? Town, County, State.
5. What educational advantages have you had? Name the schools you have attended, and the time spent in each?
6. What branches have you studied, and to what extent have you pursued them?
7. In what occupation have you been engaged other than that of student, and how long were you thus employed?
8. When did you commence studying dentistry? Month, year.
9. How many months of actual medical and dental study have you had to date?
10. Have you attended a full course at any medical or dental school? If so, where and when?
11. With what preceptor, or preceptors, have you studied? Give name and present residence.

Sign your name in full.

Write an English composition, of at least two hundred words, upon a subject of the examiner's selection.

Further examination to be left to the judgment of the different faculties. The examination proposed is to embrace the following:

(1.) English Grammar. (2.) Arithmetic. (3.) Geography. (4.) Modern History. (5.) Government Topics.

A failure to pass the examinations may be communicated to other colleges.

Resolved, That the Colleges of this Association will receive into the senior class only such juniors as hold certificates of having passed a satisfactory examination in the studies of the junior year, this certificate to be a pledge to any college to which they may apply that a previous term has been properly spent in the institution whence they came.

Resolved, That the certificate shall read as follows:

This is to certify that.....has attended one full course at the.....College of Dental Surgery..... He was absent from lecturesweeks. He was absent from practical work..... weeks. He was examined at the close of the session, and found qualified to enter the senior class.

Resolved, That each student upon completing one regular course in any college represented in this Association shall be furnished with the above certificate, without presentation of which he shall not be accepted by any of our colleges for admission to the senior class.

Dr. Wilson then offered the following :

Resolved, That a committee of three be appointed to take into consideration the advisability of having a uniform practice in the furnishing of equipments for clinical work. Carried.

Obituary.

DR. ISAIAH FORBES.—Dr. Isaiah Forbes, who died at St. Louis, July 15th, 1885, at the age of 75 years, will long be remembered in the west as one of the leading dentists of his day.

He began the practice of his profession in St. Louis in 1837, when the city contained only from eight to ten thousand people. Having studied dentistry in the office of Dr. Ambler of New York, he sought the West as the place most likely to open for him an avenue of useful labor. In this he was not disappointed. He early gained the confidence of the people and retained it through a period longer than any other man that ever practiced in this city. Dr. Forbes was not what could be called a brilliant man in his profession. He had no special aptitude to any one particular branch. He was not a close investigator. Yet he was endowed with that faculty of encouraging everything that pointed to a broad and liberal professional advancement. It is not always so much in what a man accomplishes himself as it is in what he helps others to, that we find the secret of advancement. Dr.

Forbes' open, generous face indicated the patron of, rather than the plodder after, scientific truths.

Tall, erect, with a clear, open countenance, elastic step, and infinite grace and dignity, he was the peer of any gentleman in the land.

His standing in society was particularly fortunate. He occupied a position rarely accorded to the dental practitioner. For twelve years he officiated as member of the school board, and for a long time was a prominent worker in the historical society of the city.

His name was never mentioned in connection with any public or charitable enterprise without carrying with it the weight of a leading citizen.

He was not one of the kind that always lived inside of a decayed tooth. While he was proud of his profession he yet had sufficient good sense and respect for the universal fitness of a thing to leave it at home when he moved abroad among his fellow men.

J. C.

ST. LOUIS, July 21st, 1885.

—*Items of Interest.*

Monthly Summary.

FRACTURE OF JAW AND TREATMENT.—Dr. Frank Abbott, New York, says: A lady patient, who was in the country during the summer, had the misfortune to be thrown from a carriage, striking on the right side of the lower jaw, in the region of the canine tooth. The jaw was thrown to the left, and, to all appearances, had a fracture near the angle on the left side. There was a fracture between the canine and lateral incisor on the right side. She was taken to a friend's house, and a surgeon—quite an eminent gentleman in Philadelphia—was telegraphed to come and attend her. He came, and did, I presume, what a good many surgeons would have done,

viz., bound her head up with bandages as tightly as he could, tied her lower jaw in its place as nearly as he could, and left matters to take care of themselves. At the end of five weeks he took the bandage off and told her she was as well as she ever would be. She stayed at her friend's house some two weeks longer, then came home, and immediately came to my office and made an appointment. This was about the first of September. I saw her at the time appointed, and on examination discovered that the fracture on the right side had not healed. The pieces were loose. If there had been a fracture on the left side near the angle, as I concluded there had been—for I could account for the one-sided appearance of the lower part of the face in no other way—it had healed apparently as firmly as it ever was. On account of the moving of the parts she was unable to masticate, and consequently was unable to take anything in the way of solid food. After carefully looking the case over, and consulting with a surgeon in this city in reference to her physical condition, it was decided that the best plan to follow was to return the parts to as nearly their normal position as possible, by the easiest and most careful means possible, and retain them in position till they had united.

That was the treatment adopted. The operation consisted in taking an impression of the lower jaw, as perfect as we could get it, making a cast and set of dies, and striking up a gold plate. This was used instead of rubber for two reasons: First, because it is a conductor of heat and cold. Second, it could be placed in position more easily. Across the anterior part of the mouth a jack-screw was fitted, and a cut made in the plate, so that a portion of it might be moved independently of the rest. The question now was, how to hold them there and prevent the right side from tipping out to far. Fortunately a molar was missing on one side and a bicuspid on the other. Through these openings I passed a piece of wire, the ends of which were soldered to the plate. This was bent in the form of a hook. The apparatus was now ready and was placed in the mouth. By turning the jack-screw a very little each day for four

or five days the parts were adjusted. The ends of the wire were then fastened around the outside of the teeth by means of a piece of small platinum wire, and thus the parts were retained immovably for five weeks. When the apparatus was removed, to the great delight of the patient, it was found, that a firm union of the fractured ends had taken place. By grinding off prominent points of the molars and bicuspid and forming inclined planes, the jaw was gradually worked around to the right; so that something approaching the original "bite" was obtained.

During the time the patient was wearing the apparatus she very faithfully rinsed her mouth six to ten times a day with antacids and anti-fermentative washes; consequently the teeth suffered very little.—*Proceedings of Odon. Society of New York, Cosmos.*

THE INTERNATIONAL MEDICAL CONGRESS.—The new Congress Committee of the American Medical Association met in Chicago on the 24th ult. Acting on legal advice, the original committee of seven decided to go to Chicago and act with the newly-appointed members. Several of the ablest lawyers in the country gave opinions to the effect that the American Medical Association possessed full control and power in the matter. The upshot of the meeting is a lively row. The chief change made in the sections was the removal of all new-coders from office, thereby displacing, among others, the chairmen of sections on Diseases of Children and on Laryngology—Drs. Jacobi and Lefferts of New York. Dr. H. I. Bowditch, of Boston, on account of alleged new code sympathies, was also removed from the office of Vice-President of the Congress. The membership of the Congress was limited to delegates from the American Medical Association and societies in affiliation with it. A complete change was made in the Executive Committee. Dr. Billings resigned the office of Secretary-General, and Dr. Packard, of Philadelphia, was nominated for the office. No sooner were the proceedings of the Chicago meeting made known than

the members of the profession in the eastern cities interested in the organization met and expressed their emphatic disapproval of the action by unanimously refusing to have anything to do with the Congress under the present *regime*. We happened to be in Philadelphia on the occasion of the meeting in that city, and found that the leaders of the profession were of one mind in their determination to withdraw. Similar resolutions have been passed in Boston and Baltimore, and we may say that the majority of the men eminent in scientific medicine and surgery in the United States have decided to hold aloof from the Congress. When we ask why they take this serious step, we learn that they have, in the first place, a deep distrust of the American Medical Association as an organization which could satisfactorily carry out such an undertaking, and they have a still deeper distrust of the success of any congress where the best known scientific medical men of the country have been replaced by nominees such as Drs. Cole, Shoemaker, and others. The exclusion of the new-code men is felt to be a serious mistake, as carrying the quarrel of the American Medical Association into the International Medical Congress and refusing the fellowship of men with whom old-coders in New York are glad enough to consult. All, too, resent the insult offered to such a veteran as Henry I. Bowditch, of Boston, who has devoted half a century to the advancement of the best interests of the profession in the United States.

What the result will be it is difficult to predict, but it is hard to see how a Congress can be held without such men as those who have signified their intention of resigning. It would be like a Congress in London without Paget, Lister, Jenner, Gull, Hutchinson, &c.; and we fear that when the profession in Europe hears of these dissensions, and the withdrawal of the very men they would be most anxious to meet, many who otherwise would have come will elect to stay away.
—*Canada Med. and Surg. Journal.*

SAVING ROOTS.—Dr. J. Taft says: I can remember, and it is not very far back, that if there was a pulpless or an in-

flamed root in a mouth, the best method was thought to be to take it away, for fear it might do mischief at some future time; and often teeth were removed with the pulps alive. I have known many cases where good teeth were removed to make way for artificial dentures. Such would not be the treatment now. All teeth and roots that can be made useful in any way should be retained. They preserve the form of the features, and do good service. In a quarter of a century the practice has so changed that the removal of what was formerly regarded as a nuisance would now be severely censured. The subject is receiving as much attention as any now before the profession. The practice of some is commendable in this respect. They act like the skillful surgeon who endeavors to save any part that can be restored to usefulness. I believe the time will come when roots, such as are now destroyed by some of the most skillful, will be saved. If roots are allowed to remain they must, of course, be restored to health.

There are many methods of crowning these roots, though none of them are good for all cases. Only by wide study and conscientious efforts will you succeed. If you fail do not give up, but try again. We cannot expect to succeed at once with a new method, though it may have great merit. Sometimes a root will be rebellious, and we fail, but that should not discourage us. Physicians lose cases, so shall we be unsuccessful; we should go on in the expectation of success, and be exceedingly careful how we sacrifice teeth or roots that might be saved. If a pulp dies it must be without any assistance from me. A physician might as well decide to kill his patient because he thought he might not get well. Never use so deleterious an agent as arsenious acid.—*Items of Interest.*

ANCIENT TEETH.—A correspondent, says *Nature*, recently referred to the use of artificial teeth by the ancient Romans, as shown by a passage from Cicero, where one of the laws of the Twelve Tables is quoted. The law in question belongs to the Tenth Table (*de jure sacro*), which deals mainly with funerals, with the object of limiting the display

and ceremonies attending them: Thus the body must not be burnt in more than three robes, or be attended to the grave by more than ten musicians; women must not tear their faces in time of mourning, nor must the bones be collected to make a new funeral with them, the bodies of slaves could not be embalmed, and the like. Section IX. of Table X., which is the one relating to teeth, reads as follows in Ortolan's text, ('*Historie de la Legislation Romaine*,' p. 121): "*Neve aurum addito. Quoi auro dentes vincti escunt, ast im cum illo sepe-
lire urevere se fraude esto*"—Add no gold; but if the teeth are bound with gold, then that gold may be buried or burnt with the corpse. The date of the Twelve Tables is put about 450 B. C., and it is thought possible by some writers that some of the provisions relating to funerals were taken from the laws of Solon. It would, therefore, appear that dentistry was known and practised to some extent in the earliest period of their history by the Romans—to an extent, at any rate, that they used gold for binding the teeth. How the artificial teeth were made, or whether they had artificial teeth at all, is not apparent. In the case of the Etruscan skull mentioned recently in *Nature*, the teeth are made from the teeth of animals.—*East. Med. Journal.*

THE MOST POPULAR MEDICINES.—Last month we published a table compiled by an American writer showing the comparative proportion in which twelve of the leading medicines had been ordered in 1,000 prescriptions which had been taken at random. It was shown that quinine was ordered 238 times, opium 136, nux vomica 130, iron 123, while iodine, mercury, bismuth and bromine are altogether at 59 and 60 times. In June 1868, we published an article by Mr. W. Willmot on "Medicine," in which a somewhat similar investigation is recorded. Mr. Willmot had analysed 1,000 prescriptions, but he did not give the details in a form which admits of exact comparison. He, however, found that quinine was far ahead of any other single medicine ordered, but, classifying all remedies in their natural groups, he found mercury prominently at the top, then potash, bark, opium and iron.

He found that out of the 768 simple and compound mendicants of the Pharmacopœia, only 485 occurred at all in these 1,000 prescriptions, while three-fourths of these were not prescribed 10 times in the 1,000.—*Chemist and Druggist*.

CREOSOTE IN DENTITION.—During the last two years, I have been putting Creosote to a use that is, perhaps, new to some of your readers. I use it during the teething process of Infants. With febrile excitement combine with it aconite or any other indicated sedative, and if diarrhœa, etc., be present use Ipecac or Baptista. I generally order Creosote x', gtts. ii. to iv., Water $\frac{3}{4}$ iv., M. Sig.: Teaspoonful two hours, later three to four hours. The Creosote x' may be prepared by adding gtts. x, (ten drops) to Alcohol 98 per cent., 100 gtts. (100 drops). The practitioner who adds the above remedy to his pocket case and prescribes in the condition named, will certainly receive thanks from the mother of the little one for the promptness with which it has been relieved.—*C. M. Brucker, M. D., in Eastern Med. Journal*.

FOR INDIGESTION.—The season of the year is now upon us when the children begin to suffer from indigestion and *Cholera Infantum*. Light clothing and fresh air will do much toward allaying the irritable condition of the nervous system, regulated diet will help still more while such aids to digestion as *Lactopeptine* may be resorted to for lessening the task imposed on stomach and bowels. By such gentle and natural means good digestion may be coaxed back—surely a better treatment than the routine of opiates and astringents.—*Louisville Medical News*.

AN OLD BULLET.—J. B. Fanning, a resident of Newton county, Miss., in 1863 received a bullet wound in the face during the progress of a battle. At the time of wounding it was thought best not to attempt to remove the ball. Last week it dropped into his mouth, having taken twenty-two years to work its way through.

REFLEX PAIN.—Dr. Black says: "With regard to this misplaced reference of pain or reflex pain as it is called, did you ever know such a thing as reflex pain when the sense of touch was implicated in the impressions? Touch is the great localizer in the nervous system; it has no other. When touch is involved the central cells have no record of an impression. There is no pain in the liver, or the cornea. The tooth pulp has no sense of touch and hence is incapable of localizing pain. The sense of touch, is requisite for the localization of pain in any part of the body. Pain in the knee in hip disease is an illustration. The pulp of the nerves has the power of transmitting sensations of pain only, and is utterly incapable of distinguishing between heat and cold, as I have frequently demonstrated. The peridental membrane has the sense of touch. Reflex actions is not within the control of the will.—

Items of Interest.

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ARTICLE I.

NERVOUS ENERGY.

BY DR. E. PARSONS, SAVANNAH, GEORGIA.

[Read before the Georgia State Dental Society, May, 1885.]

GENTLEMEN—The subject I have chosen for your consideration at this, our Annual Meeting, is "Nervous Energy, how Actuated, and its Varied Phenomena." No one can question the importance of knowing all that can be known about it.

There is an invariable law by which means mind acts on matter, and it is my purpose, in this paper, to briefly elucidate what I have learned by reading, observation and experience on the subject. The great advantage of meeting in council is an increase in knowledge on all subjects in any way relating to our profession. We have many things yet to learn that will be, when known, of great benefit to both ourselves and the public.

Science demands a full and free investigation of all or any causative principle by which life is manifested, or death produced. So long as we draw our conclusions only from appearances, we shall often be deceived in a correct diagnosis; consequently often fail to cure diseases that come within the legitimate bounds of our specialty.

Proper remuneration for our services are absolutely necessary for the respectable maintainance of ourselves and those dependent on us; but our best men are laboring unweariedly in their endeavor to elevate our standard throughout the world, but particularly in our own country, and this Society can do much to help them in their onward march, developing all possible improvements in Scientific Dentistry.

Again, we all have a full consciousness of three things—we love, we think, we act. But few have a scientific knowledge of the means employed by which mind acts on matter. There are such varied forms and circumstances controlling its development, that we need not marvel at anything that comes within the sphere of our observation. As we are brought face to face with almost every possible condition of the nervous system, our opportunities for investigating the various manifestations of nervous energy, its source and supply, may we not equal any other specialty in solving the great problem of cause and effect manifesting nervous energy? As the brain is the seat of all sensation, I briefly present some of the best authenticated views of its organization. I think you all will agree with me that it is wonderfully constructed by Infinite Wisdom for the development of the finite mind. In the elucidation of my subject, let us not forget the fact that the blood has much to do with the various conditions of the nervous system. It holds, or should contain in solution, all the elements necessary for the growth and sustenance of every organ in the body; it is both a receiver and a giver; it is fed from what we eat and drink, without which it cannot perform the office intended.

THE BRAIN.

The brain is divided by the septum into two lobes, right and left sides ; also, into the cerebrum and the cerebellum, front and back sides. Phrenologists divide the lobes into about forty convolutions, assign to each a distinct office, and by careful observation of each as to their development, profess to know individual character, and point out what kind of occupation one, by nature, is best fitted for.

In 1840, Dr. Sherwood, of New York, by ingenious experiments, demonstrated the fact that the brain has four large poles, two in the cerebrum and two in the cerebellum, and from these proceed not only the convolutions, but every nerve in the body. By these, and experiments in animal magnetism, he maintained that animal magnetism is the motive power of the human system, and without it there can be no connection between mind and matter.

In the Fall of 1844, I invited several of our most eminent physicians to meet me at my office to witness some experiments in magnetism. My subject for demonstration was a young man of unimpeachable character, twenty-three years of age. My visitors were very skeptical on the subject of magnetism. There had been some public exhibitions, but the result did not satisfy them.

I said, as the science of phrenology is ridiculed by some, I wished first to exhibit each convolution of the brain, in a state of exaltation, while he is as wide awake as we are. To prevent any suspicion of collusion, I handed them a chart containing the names of the different convolutions of the brain, and requested them to write on paper any question or the name of the organ, for me to excite.

The first paper had on it mirth. I placed the point of my finger over the organ, and he immediately broke out into an uncontrollable fit of laughter. I passed off the influence and he instantly became calm. They asked him what he laughed at. He said he did not know ; he could not help it.

The second paper had on it veneration. I excited the organ, and he immediately bowed his head and assumed the attitude of the most zealous pietist, and appeared to be in earnest prayer.

The next paper had on it music. I excited the organ, and he immediately commenced singing with as much earnestness as if his life depended on it.

The next paper had on it combativeness. I excited the organ; he immediately doubled his fist and pitched into an imaginary enemy in the most vigorous manner possible.

Not to take up too much space in this paper, I will only add, we went through with about twenty of the organs with equally marked results, which both pleased and astonished my friends. They said they now thought there was much more truth in the science of phrenology than they had supposed possible. I then said you have seen the effect of so-called animal magnetism; I will now exhibit a different phase of it. I magnetized him in the usual way, and said he is now as oblivious to all external impressions as if his five senses had no existence. Examine him and satisfy yourselves.

After a thorough examination, Dr. Richardson said he believed he could cut off his leg and he would not feel it. I demagnetized him, which restored him to full consciousness. They questioned him about it. He said he did not remember anything done in that state. They then said if it was practicable it would be a good thing in surgical operations. They thanked me for the pleasure of witnessing the experiments, and retired.

To understand the different nervous conditions of patients is of vast importance to both dentists and physicians. This cannot be attained without close observation and experience. If the nervous temperament of a patient is known, we shall have a key to guide us in our treatment in every individual case. Temperament is usually divided into six distinct classes :

1st. Nervous bilious; 2d. Nervous sanguine; 3d. Nervous lymphatic; 4th. Bilious nervous; 5th. Sanguine nervous; 6th. Lymphatic nervous.

You have doubtless observed a difference in the quality of human teeth. We usually find the best in the nervous bilious temperament, and the poorest in the lymphatic nervous. Viciated tastes and habits do not change the shape of the teeth when once formed, but their quality. Science demands discrimination under varied circumstances; it is not possible to treat all alike, and be equally successful. I shall refer to this again below.

I now present you with a few incidents in practice which may serve as a basis for a better elucidation of my subject:

1st. In the Fall of 1835, I was called to see a gentleman at eight P. M., represented to be suffering greatly, and unable to come to my office. I was introduced to a large man walking the floor in great agony. Seating him in a chair, I found the left side of the face swollen; a purple colored spot over the antrum; the first molar on the left upper jaw filled with gold; tooth firm, but evidently devitalized. I diagnosed the trouble to be abscess in the antrum. I extracted the tooth; he sprung out of the chair and dropped on the floor, face downwards, and quivered like an ox struck on the head with an ax. I used cold water freely to his head, and soon brought him to; placed him back in the chair; made a free passage through the front labial socket into the antrum, and the pus flowed freely. He then laid down on the bed much relieved; gave him a half grain of opium; waited about twenty minutes and injected the antrum with warm green tea; directed his head to be kept cool with cloths wet with cold water; left him with a promise to call again in a few hours; called again about three P. M.; was told he had been sleeping several hours; I injected the antrum with a weak solution of nitrate of silver; saw him the next morning and again injected the antrum with a much stronger solution of nitrate

of silver; the swollen cheek appeared almost natural; said if he needed my service any more to come to my office. About a week later he called on me; brought me a sack; said a few hours before that he blowed it out through the left nostril; it was about one and a fourth-inch long, and about the size of an ordinary goose-quill; it was soft with a leathery like appearance; said he was all right; paid his bill; have not seen him since.

2d. In September, 1836, I was called by a physician to see his wife. He said she was suffering terribly from facial neuralgia, and thought it was caused by a tooth. She was in her eighth month of pregnancy. He had applied the usual remedies, which gave no relief. I examined her teeth; found both the third molars on upper jaw decayed, and on slightly tapping them with the handle of an instrument, the pain was greatly increased. He said he was afraid of the consequences, in her state, of having the teeth extracted. I told him nothing else would give relief. She said take them out, it cannot be worse than I am now suffering. I parted the gums from the teeth with a lance; I had barely completed this part of the operation when she fainted; her mouth was open; I took my forceps and extracted both teeth; brought her head forward to prevent the blood running down her throat; we soon brought her back to consciousness, and the first thing she said was: "I cannot have them out." Her husband said: "Darling, they are both out." She said, "Are they? I did not feel it; I am so glad; the pain is all gone." The Doctor said to me—"You are a bold man: I would have stopped you if I could, but you was too quick for me." I afterwards learned that no serious result followed the operation.

3d. In August, 1856, a young lady, aged about twenty, came to my office at eight o'clock A. M. Temperament nervous, lymphatic. Said she had not slept a wink all night. Her face was pale, hands cold, pulse feeble. Said she had a mortal dread of having a tooth extracted. I put my mouth-mirror into her mouth for examination, and saw

the tooth caused the trouble. In an instant she fainted. I took my forceps and extracted the tooth, used restoratives and soon brought her to. The first thing she said was—"I cannot have it out." I showed her the tooth. She said: "Oh! I am so glad I did not feel it;" and left the office laughing about it.

4th. In the Fall of 1858 a lady called to have the two upper front incisors filled. She appeared to be middle-aged, and apparently in good health. On examination, the teeth were very close together—not badly decayed, but must be separated for sufficient room to enable me to do the work properly. Our only means, then, was either wedging or filing them. I filed about one quarter of what was necessary, and she fainted. I then filed as rapidly as possible while she was unconscious, and completed this part of the operation, and used restoratives, and soon brought her to. I gave her a glass of wine, and completed the operation without further trouble.

5th. In the Fall of 1874, a lady called to have a tooth extracted. She appeared to be in good health; said she was almost distracted with toothache; was afraid to take chloroform; was afraid as of death without it. I said the pain would be only momentary, and would not kill her. I extracted the tooth, and she fainted. My usual remedy in such cases was hartshorn and cold water. Through mistake, I took up a vial of the Essence of Gaultheria, poured a little on a handkerchief, held it to her nose, and was surprised to see how quickly she recovered consciousness. This prompted me to experiment with it. I concluded that if it was a good restorative, it might be a useful preventative.

I soon had a chance to test it. A lady called to have an ulcerated tooth extracted. She was in delicate health: face swollen, hands cold. She said she would like to take chloroform, but her physician said she must not take it; she knew she would faint without it. I told her I thought that could be prevented. I took a doily, folded it small,

and poured about a teaspoonful of the essence on it. I told her to inhale through her nose, and exhale through her mouth. She continued this until her brain was pretty well stimulated, and the tooth extracted. She showed no signs of syncope, and could hold a glass of water as still as I could. I have not had any one to faint away in my office since.

In the Spring of 1874, a lady, aged about sixty, came to consult me. She said that her teeth were so bad she could not eat any ordinary food; had disease of the lungs; was forbidden to take chloroform. After an examination, I told her she had eight teeth in the upper jaw that could not possibly be made useful, and she had better have them extracted. She said she had never had one extracted without fainting dead away. She could not think of having more than one out at a time. Her temperament, nervous sanguine, emaciated hands cold, pulse very feeble. I told her if she would follow my directions I would take them all out and she would not mind it more than one, and guaranteed she could not faint if she tried. I explained the effect of the wintergreen, and said it would do no more harm than a glass of good wine. I administered the article, as before described, until her face flushed, tears ran down her cheeks, then extracted the eighth teeth without her closing her mouth. She asked if they were all out, and I said yes. She said, "Is it possible?" I gave her a glass of water. It did not show the least tremor of the nerves. She left, giving me many thanks, saying that she felt much better than when she came into the office.

I could relate many more similar cases, but do not deem it necessary. My object is to show what may sometimes be done to advantage in cases of syncope, and also the means of preventing it while performing a painful operation.

As before said, the brain is the seat of all sensation; and our patients, no matter how nervous they are, if the brain is properly stimulated, cannot faint—caused by the

extraction of teeth. When my patients are known to be pregnant, I always use the stimulant above described before performing any painful operation; it always prevents any severe shock of the nervous system when in this condition.

If any one wishes to know how to prepare the Essence, it is as follows: To one pint of alcohol add one ounce of the Oil of Gaultheria, commonly called Wintergreen. Shake it well and it is fit for use.

In passing from a conscious to an unconscious state, all the Clairvoyants I have questioned on the subject say it is affected by a change of polarity of the sensory organs, and the principle is the same whether caused by animal magnetism, syncope or anæsthetic agents, and if only the voluntary organs are affected thereby, there is no danger to life, but if polarity in the involuntary is reversed, the heart ceases to beat and death is instantly the result. I was the first in this city to administer ether for the purpose of extracting teeth without pain. In a few cases it developed paroxysms of hysteria; otherwise no harm was done. I have administered ether, chloroform and gas to over two thousand persons. With chloroform, I had three cases that barely escaped death in my chair; with gas, some after deleterious effects followed in two cases.

Admitting man's physical organization to be a magnetic machine, the deaths that have occurred are easily explained, when caused by these powerful drugs. The voluntary organs are under the control of the will, and during our waking hours there is a constant draft on our magnetic supply; it is best recuperated by sleep, when the will is at rest.

The involuntary organs do not sleep until death ends our earth life. We can readily understand that if by any cause polarity in the two large poles in the cerebrum are reversed, the gateway by which we gain a knowledge of things about us is closed so perfectly that physical sensation is impossible. On the other hand, if the equilibrium between the two large poles in the cerebellum are not well

balanced, just in this proportion some kind of ailment is the result. Let us not forget that the will has no control over these poles, and all medicine that does not beneficially act on them is non-curative. Now, just in proportion as anæsthetic agents disturb their equilibrium, they are dangerous, it makes no difference whether polarity is reversed or destroyed; in either case the principle of life can no longer act on the nerves by means of its intermediate; the heart ceases to beat, and restoration is impossible. Chloroform is more easily administered than ether or gas, and most convenient when the patient cannot come to the office; but we should remember that many deaths have occurred when given for the purpose of extracting teeth, and that, too, when least expected. The public mind is more horrified at one death in the dentist's office than twenty caused by a railroad smash-up. We have now the means that will stimulate the nerves, greatly mitigate the pain and not endanger either life or health.

I have long desired a perfectly safe anæsthetic that can be administered no matter what the condition of the patient. I am now creditably informed that Dr. Mayo, of Boston, some eighteen months ago, by various experiments, produced a compound article that satisfied him was harmless. He would not put it on the market until it had been thoroughly tested by both dentists and surgeons. All who tested its effect and efficiency testified to its great superiority over all other known anæsthetics for dental and minor surgical operations. It is now only a few months since he made arrangements for its manufacture and appliances, and put it on the market. He has named it Mayo's Vegetable Vapor Anæsthetic. I have been using it for extracting teeth very successfully. The nitrous oxide causes the patient, when fully under its influence, to have very like the appearance of a corpse. The action of this new anæsthetic does not act on the vital organs, and the patient appears like one in a natural sleep, and, in my opinion, is perfectly safe and without danger to life or health.

Our patients come to us for either a preventative or curative treatment. As before said, we are brought face to face with almost every conceivable condition of the nervous system, and the more true knowledge we have of it the better are we able to satisfactorily manage them. Some come in a very excitable, and some in a very depressed state. We need means to quiet the former and stimulate the latter.

Again. To be fully entitled to the name of Scientific, we must know something of the laws of life, in order that we may obey them and fight life's battles manfully—doing justice to others and with credit to ourselves. Life, in itself, is not creatable, but given to us with power to properly use or abuse, the end being the creation of the finite mind. I have explained above the means by which it acts on matter, but as a further illustration, let me say, you drop an article on the floor, gravitation holds it there; you desire to pick it up, how can you do it; if you have sufficient will-power it will act on the magnetic element, this on the nerves, these on the muscles. You stoop down and pick it up, and probably not one in ten thousand have a single thought about the necessary means by which you are enabled to do so, so little do we reflect about causative principles involved in what we do.

So far as our voluntary organs are concerned they may be compared to a locomotive engine. They are both useless if the motive power is wanting. To make the engine useful, steam must be generated by means of fire and water; and to make our voluntary organs useful, animal magnetism must be generated by means of life and the atmospheres. The engineer controls the steam power, and human will controls the magnetic power, and when properly applied, if the machine is in good order, locomotion is the result in both cases. I will only add, the steam acts on the piston heads and causes the crank to move and the wheels to rotate. Magnetism acts on the nerves, then on the muscles, and man moves in any direction he chooses. A dentist with a strong will, if he uses the proper means,

can more easily and favorably impress his nervous patient than one with a weak will, and the reason is, he imparts more of his animal magnetism, which has a stimulating effect on the nerves of his patient. There is a magnetic sphere emanating from both man and beast, particularly when in motion. Were it not so, no dog could follow their tracks successfully. All pain is the result of an obstruction of a normal flow of the magnetic current, whether caused by disease or otherwise.

Arsenic, applied to the nerve of a tooth, destroys its polarity, and applied to any other nerve it is no longer capable of being actuated by the magnetic current, without which there can be no sensation, and death is the result. Physical endurance depends largely on the mind and the state of the nervous system. The difference in individuals to bear pain is marvelous; some one can have a tooth extracted and seem to care but little about it, while others, without the use of a preventative, appear to suffer intensely, and in some cases the operation causes syncope.

In conclusion allow me, to say, a vast field lies before us, and if cultivated properly this Society will in due time reap a rich harvest, the benefits of which cannot now be estimated.

The grand distinction between mind and matter may be seen thus: If we give any physical object to another, we part with it, but if we give a new idea on any subject, we do not part with it, but in so doing its boundaries are enlarged in our minds.

The space occupied in briefly presenting my views on the subject I have chosen is greater than I at first intended, but the fundamental principles which underlie everything with which we have to do, and the importance of fully understanding them, is my only apology for occupying so much of your time.—*Dental Luminary*.

ARTICLE II.

PULPLESS TEETH.

BY DR. WILSON, OF BURLINGTON, MEMBER OF THE FACULTY
OF THE DENTAL DEPARTMENT OF THE STATE
UNIVERSITY.

[Extracts of a paper read before the Iowa Dental Association at its
late annual meeting.]

A pulpless tooth is not necessarily a dead tooth, but a dead tooth is, of course, a pulpless tooth. The adjectives "pulpless" and "dead" are not, therefore, synonymous, although frequently so used, especially by medical writers. Let us note the marked distinction between the two. A pulpless tooth may be a part of the living organism—a dead tooth has its nutritive supply entirely cut off, and it is in every sense a foreign body—it is dead and inert. The former may be restored to health and usefulness—the latter should always be condemned as a nuisance that cannot be abated without the use of the forceps. * * * *

Having thus briefly called attention to the fact that the dentine and cementine derive their vitality from independent sources—that the life of the one is not dependent upon the life of the other—that a pulpless tooth is not necessarily a dead tooth—we are prepared to consider, understandingly, the subject of this paper. It may, however, seem like presumption on the part of the writer, in thus offering the foregoing to an intelligent body of dentists, when every student of dentistry at the close of his junior year should fully understand the facts above stated. But I am led to a consideration of this subject from articles entitled, "Dead Teeth in the Jaws," that have appeared, from time to time, during the last two years, in the *New York Medical Record*, and as those articles come from high sources in the medical

profession, they deserve more than passing notice. The able editor of that journal, and Dr. Samuel Sexton, a distinguished oculist and aurist of New York City, being the principal writers referred to.

The *Medical Record* of October 4, 1884, contains a report from the aural service of Dr. Sexton, entitled, "Pain in the Ears due to Irritation in the Jaws." He describes a number of cases of otalgia in which he found the lesion to be in diseased teeth.

He goes on to say that "since dentistry had become such a popular business, and diseased teeth had been so carefully retained in the jaws, nervous diseases about the head were becoming alarmingly common."

The same number of the above journal contained an editorial on "Dead Teeth in the Jaws," which read as follows: "Perhaps the time is near at hand when medical men should be themselves better informed concerning diseases of the jaws and mouth, rather than refer the ailments of this region to individuals whose limited knowledge of medicine does not prevent them from 'treating' dead teeth long after their presence in the jaws has given rise to alveolar abscesses and neuralgias more or less painful. It would not be strange if in the course of events, the day would soon come when all teeth without pulps, and hence in process of more or less rapid decay, as well as those which the deposit of tartar, or other cause, had become entirely divested of periosteal nourishment, would be promptly condemned as unfit to remain in the jaws, regarded in fact as foreign bodies liable to give rise, not only to cerebral irritation and disease in the organs of special sense, through the propagation of local disturbances in the mouth to the regions mentioned, but to endanger likewise the general health through purulent matter discharged into the mouth from alveolar abscesses, to be continuously swallowed for a long time, or, indeed, in some instances, to be absorbed and thus produce septicæmic poisoning. It is certainly gratifying to note the establishment of in-

struction in oral surgery in some of the medical schools, and it is to be hoped that this subject will receive the attention its importance demands."

Dr. Sexton cites the readers of the *Record* to eight cases of otalgia resulting from diseased teeth. I have no doubt but a majority of the dentists before me to-day have met with almost that number of cases in practice every week; nor do you find it a difficult thing to render prompt relief, and that, too, in a large majority of cases, without the use of the forceps. And I believe that I am warranted in saying that in at least three-fourths of the cases met with in our practice, we find the reflex pain in the ears due to exposed living pulps, and not to "dead teeth in the jaws."

That diseased teeth do cause reflex trouble, not only in the head, but frequently in more remote parts of the body, is a fact well-known to every competent dentist. I am glad that Dr. Sexton has at last discovered the fact, that diseased teeth do frequently cause reflex pain in the ears, and in other neighboring parts, and that alveolar abscesses very often cause catarrhal affections of the maxillary sinus and of the nasal passages, and that diseased teeth will endanger the general health. It is to be regretted, however, that the doctor has found it necessary to charge this unfortunate state of affairs to the ignorance of dental practitioners, who are in no way responsible for but few of the many cases met with in practice, for there can be no doubt but a very large majority of the teeth causing the troubles above referred to have never received any treatment whatever at the hands of dentists, and because Dr. Sexton has discovered that in certain cases pulpless teeth (or dead teeth as he calls them), has caused the ailments above referred to by Dr. Sexton, there can be no doubt. Every dentist of any considerable experience can enumerate such experiences by the score, and the medical profession has only been too slow to recognize the facts discovered by Dr. Sexton.

The only difficulty with these medical gentlemen is,

that they have drawn very erroneous conclusions from the important discoveries they have made. Their limited knowledge of the minute structure of the dental tissue, and the source from which each derives its life, is manifested by the erroneous statements upon which they have based their arguments, and then after arguing from false premises, Dr. Sexton says: "In regard to the treatment of pulpless teeth, the practice in vogue seems the reverse of precedures founded on well-established surgical principles." And in an editorial of the same issue we are informed that the treatment of diseased teeth is carried, to what "the medical minds regard as a dangerous extreme."

That some members of our profession have been over zealous in their efforts to save all diseased pulps alive, there can be no doubt. We will occasionally meet with an enthusiast in our profession who will say, "I have no use for forceps, I never extract teeth." I have heard that statement made on the floor of the Iowa State Dental Association.

That incurable diseased teeth should not be tolerated in the jaws does not admit of discussion. Good common sense ought to settle that question. And again, there are extremists who never devitalize diseased pulps, no matter how badly exposed, but "doctor them up," and stupify them, and then bury them in a living grave. Much evil has grown out of this practice.

Some one has said that to cap a badly exposed pulp is to create a slumbering volcano, and he might well have added that such volcanoes have but a limited time to slumber. Gentlemen, there are in our own country ten thousand volcanoes belching forth—not pure molten lava—but impure gases and putrescent matter of the most sickening character. The craters to these volcanoes are not found on the mountain top, but they are found in human mouths—in the antrum of Highmore, in the nasal passages, and externally on the face, neck, or even on the chest.

When the pulp of a tooth is dead and confined within

its bony walls an outlet is sought, and must be affected for the escape of impure gases arising from the decomposing pulp and for the putrescent matter associated with it. When thus confined its only way of escape is through the dental foramen, and into tissues adjacent thereto. The pressure thus brought to bear upon the bony walls surrounding the apex of the root will in time perforate it at its weakest point, and the poisonous matter is forced through the opening thus formed and into the soft tissues, which soon yield to the pressure, and the imprisoned mass of corruption is liberated. The pain and swelling now subsides, but a dangerous nuisance has been created. The channel formed from the apex of the root to an external opening will not close while it is used for the passage of foul matter and gases that will flow unceasingly from the pulp canal.

The remedy of course is to remove the cause, and assist nature in affecting a cure, and to do this the pulp chamber must be opened, its contents removed, the canals cleansed and disinfected, the abscess healed, and the roots filled to the exclusion of all fluids and purulent matter. But how often this is not done. How many thousands of suffering mortals are to-day dragging out miserable lives because of these drainage tubes emptying themselves into the oval cavity—into the maxillary sinus or into the meatus of the nose. Such an abiding nuisance in the mouth cannot long exist without ruining health. But how few of the unfortunate sufferers realize the cause of their nervous irritability, their loss of appetite, their feeling of lassitude, their lack of energy, and their general prostration. And here let me say, that but few, in comparison to the number of these unfortunate sufferers seek relief at the hands of the dental practitioner. The patient is neither sick nor well, but debilitated and "good for nothing." The family physician is consulted, nervines and tonics are administered, but to no avail. The septic matter is vitiating the air that is breathed, and poisoning the food that is eaten.

The saliva that is poured into the mouth from the various glands must mingle with this poisonous matter and carry it into the stomach.

Sanitary means are being employed in all our cities at the present time, in view of the cholera scourge that it is feared will sweep over our land the coming summer. Our physicians wisely talk and write about the baneful influences of impure water, about miasma arising from the decomposition of vegetable matter, and about unwholesome food, and it would be well if the public would heed their timely warnings. And as dental practitioners, I feel that we, also have an important duty to perform, in enlightening our patients, and the public so far as we are able to do so, in the direction I have above indicated.

The subject is of paramount importance, and as the opportunities come to us in every day practice, let us not fail to impress upon the minds of our patient (when we find it necessary to do so), the fact that a clean mouth is essential to health.

The agitation of this subject, by the medical profession, is a step forward. Hitherto medical men have not given the matter the attention its importance demanded.

And now that this new light has dawned upon Dr. Sexton, it is not strange that, in hastily drawing his conclusions, he should have mingled much of error with the truths he has discovered. Possibly some of the cases that have come under his notice may have been the result of bad practice on the part of incompetent dental practitioners, but to charge the dental profession with their shortcomings would be a matter of great injustice. Dr. Sexton is too hasty in his conclusions. First, he discovered that certain pulpless teeth had caused certain ailments, hence he condemns all pulpless teeth. He has discovered that certain dentists have failed to treat such teeth successfully, hence he condemns the dental profession for attempting to save teeth, it would be equally fair to condemn the whole medical profession, because of the incompetency of some of

its members. But before dismissing the subject of pulpless teeth, it may be well for us to examine the subject a little more carefully from the standpoint of the medical writers above referred to. We cannot afford to make a mistake with regard to so important a matter. The higher a man stands in his profession, the more serious the mistakes he makes, and the more important it is that his practice be sound. An enthusiast or an extremist may injure a good cause. There are such men in our ranks.

A few years ago a prominent dentist said, "The tooth's pulp is its soul, and it is criminal to destroy it."

I heard another prominent dentist say, "If I find a part of the pulp dead, I amputate the dead tissues, and save the balance of the pulp alive."

A dentist has just moved away from Burlington, who has been in practice there for fifteen years, and during that time he has been using arsenic for obtunding sensitive dentine, and he has succeeded in accomplishing his purpose admirably. I have found in one month half a dozen filled teeth containing dead pulps, and, of course as many alveolar abscesses in active operation. The evils arising from such abominable methods of practice are simply appalling.

* * * * *

I have less frequently met with cases where those fistulous opening were on the neck or chest. In those cases the roots of the teeth are usually long, and when the abscess breaks through the lower border of the jaw, and the pus comes in contact with the soft tissues, it follows the course of the muscles and forms a sinous as it gravitates to some point on the neck or chest. I have known of a number of such cases being under medical treatment for years, where the affection was supposed to be of a strumous nature, and the real cause was not suspected, and in every case a rapid recovery has followed the extraction of the offending tooth.

* * * * *

Gentlemen, I have no doubt but the most of you are disappointed in the nature of this paper. I have scarcely alluded to the treatment and filling of pulpless teeth. That had not been my purpose. But I have wished to call attention to the fact that a large majority of the ailments above referred to have been due to diseased teeth that have never received any attention whatever at the hands of competent dentists.

That pulpless teeth and roots may be treated, filled, and preserved in health in a majority of cases, is a settled question. Every well-informed dentist knows that to be a fact, the distinguished Dr. Sexton and the able editor of the *Medical Record* to the contrary notwithstanding.—*Iowa State Med. Reporter*.

ARTICLE III.

DEAD TEETH IN THE JAWS.

TRUMAN W. BROPHY, M. D., D. D. S.

In reply to Dr. Sexton on this subject, Dr. Brophy makes these pertinent remarks in the journal of the American Medical Association:

Dr. Sexton says: "The retention in the jaws of teeth which are diseased, have become irredeemably sensitive to thermal influences, or deprived of adequate periosteal nourishment through calcareous formations about the roots, very frequently gives rise to nervous diseases about the head. I am convinced that these reflected nerve influences manifest themselves much oftener since dentistry has come more extensively into practice during the present generation, and greater efforts are made to retain defective teeth in the jaw."

That diseases of the teeth are often the center from

which pain is reflected to the eyes, ears and other parts, all experienced clinical observers must admit. But that these pathological conditions of the teeth, from which reflected pain has its origin, can be and are successfully treated and cured with rare exceptions, as effectually as any other diseases, is a fact too well established to be set aside.

It is not possible to describe in this letter the method by which the various diseases of the teeth are treated, but suffice it to say that "teeth which are diseased from death of the pulp or from caries" *do not* "become irredeemably sensitive to thermal influences." In proof of this statement, many thoroughly educated medical men, practicing the specialty of dental surgery, will testify.

"Teeth deprived of adequate perosteal nourishment, through calcareous formations about the roots, very frequently give rise to nervous diseases about the head." To this statement I assent, but dissent as to the remedy not mentioned but implied. *i. e.*, the removal of the teeth. If the calcareous deposits mentioned have destroyed so much of the pericementum and the alveolar processes as to render the teeth very loose; if, indeed, the teeth have lost their bony support and are retained by means of a remnant of pericementum only, they cannot, of course, be restored to permanent health and usefulness, and their removal is, therefore, indicated. Teeth in this condition "frequently give rise to nervous diseases about the head."

On the contrary, if the calcareous deposits have not destroyed the pericementum and alveolar processes to a very great extent, the condition is amendable to intelligent treatment and cure. In answer to the assertion that "Reflected nerve influences manifest themselves much oftener since dentistry has come more extensively into practice during the present generation," I would say, that with equal propriety it might be said that reflected nerve influences manifest themselves more frequently since gynæcology has come more extensively into practice. To attribute the obvious increase of nervous diseases during the pres-

ent generation to diseases of the teeth is a statement not only "sweeping," but "overdrawn." *Much harm* is no doubt done by some of the modern appliances "for retention in the mouth of substitutes for absent teeth," and the unhealthy state of the gums and contiguous parts, established and maintained by the presence of these substitutes, unquestionably give rise in many cases to reflected pain.

When Dr. Sexton attempts to establish a *law* governing the management of diseased teeth, it must be based on more substantial grounds than those which he presents. The case related of his patient, the "medical man, who practices dentistry," and who was convinced that an inflammation of one of his ears began from the time the upper second molar of that side was treated for a diseased pulp, is simply an assumption, on the part of the patient, that the ear trouble had its origin from the diseased tooth, and the patient's diagnosis of his own case seems to have been accepted by Dr. S. as conclusive. The ear disease in this case may have emanated from the diseased tooth, but no evidence is produced to that effect. In regard to the query as to "whether it is safe practice to retain dead teeth in the jaws," I would say that thousands of people in our own country have had pulpless (not dead) teeth in their jaws many years, which are exempt from pericemental disease, and which serve all the purposes for which teeth were provided. To ask whether it is safe practice to retain these, so-called, dead teeth in the jaws when they have been comfortable and useful from ten to forty years and promise to remain so through life, seems like a proposition too injudicious to need comment. While the death of the pulp results in "cutting off the source of nutrition from the dentine," it does not follow "that in a large number of instances irritation can not be easily controlled."

Neither does the tooth become a foreign substance. The dentine and the enamel are, of course, no longer nourished after the death of the pulp, but their resisting structure renders them capable of maintaining their integrity

many years after the pulp has been removed; and pericementum will nourish the cementum and thereby retain the tooth in its alveolus in a comfortable condition. In order, however, to thus retain the tooth and prevent inflammation from supervening, the devitalized pulp must be removed, the pulp canals thoroughly disinfected and filled with a plastic material which hardens when in position. Dr. S. most clearly exhibits his imperfect knowledge of the dental operations in vogue when he says: "Inflammation of exposed dentine cannot surely be entirely arrested in any case by filling the pulp cavity with any known extraneous material, and especially is handicraft wanting to even imperfectly protect the minute and often tortuous canals leading down to the apical foramina of the majority of the teeth." To arrest "inflammation of exposed dentine by filling the pulp cavity," in the opinion of Dr. S. would seem to be most desirable. How a tissue without nourishment and consequently without vitality can take or maintain inflammation is beyond comprehension. The impervious filling which I have mentioned will close the apical foramina, together with the canal, which "in the majority of cases" is *not* tortuous to a degree of rendering the perfect filling of the root difficult or uncertain, and the assertion that the dental surgeon "is able only to offer a hopeful but uncertain prognosis in these cases" is contrary to well established fact. There are no diseases to which mankind is heir more scientifically and effectually cured than the diseases of the teeth in question.

Again: "The dead tissues of the dentine will sooner or later, most likely, be transmitted through the tissues of the cementum to the periosteum." Communication between the lacunæ canaliculi of the cementum with the tubuli of the dentine is not free; indeed, it seldom exists, hence it cannot be "that through the periosteum alone the dentine may long derive some nourishment."

About 22,000,000 teeth are annually extracted in the United States, and I regret to say this enormous loss of

teeth is to no small extent due to the indifference manifested by physicians in the anatomy, physiology and pathology of these organs. It is a fact, no one will attempt to gainsay, that hygienic measures directed toward the preservation of the deciduous set, if understood, are seldom recommended by the general practitioner to the families under his charge. The premature loss of these teeth paves the way for early lesions of the permanent set. The pain resulting from advanced caries of the deciduous teeth, owing to the difficulties encountered in controlling the patient, is not easily treated; moreover, the injurious impressions thus made on the system of the child abide through life. There is no doubt hundreds of thousands of teeth are unnecessarily extracted each year, and then drugs are given with a view of curing the patient of the disorders of digestion and other abnormal conditions which follow, and which in turn arise from imperfect mastication of food, verily for the want of teeth.

We need to know "what's the matter" in the treatment of these "nervous diseases about the head," as in all others; and apply a remedy which will bring the abnormal tissues back to health. Too often, indeed, has it happened that patients, by advice of their medical attendants, have submitted to the loss of many, and, in some instances, to all their teeth, in the vain endeavor to be relieved from trigeminal neuralgia. You may ask, Why this useless loss of teeth, and all the resulting evils? Because the advice given was not wise; the etiology of the affection was not understood.

There are certain pathological conditions of the teeth which have not been mentioned in this discussion, and which give rise to reflected pain of the eyes, ears, and other parts.

Among these may be mentioned exostosis of the roots of teeth and nodules of calcific matter within the pulp canals in contact with a living pulp. The former of these conditions has been regarded incurable, the removal of the

tooth with the united bony tumor being indicated. In favorable cases, however, this tumor may be excised and removed without removing the tooth. The pulp nodules of calcified deposits within the pulp chamber may be, in a large majority of cases, successfully removed without sacrificing the tooth.

No one approves more than I the removal of the causes of disease. It is no more necessary to extract a tooth at the root of which an alveolar abscess has formed than it would be to amputate a limb for the cure of an abscess of the medullary substance of its bone. Disease of the eye sometimes requires that it be enucleated, but the honest, skilled ophthalmologist *would not* remove the eye when he *knew* he could restore it to usefulness. The spirit of the teachings of Dr. Sexton's articles is far from being progressive. Nor is this all; many assertions are not based on fact, but on erroneous impressions. Our duty to our profession and the laity is not to destroy but to save; and while ignorance is ever working its mischief in all vocations in life, it is not just to accept the results of such work as a basis on which to found a law.

ARTICLE IV.

DIAGNOSIS AND TREATMENT OF DENTRITIC CYSTIC TUMORS OF THE JAWS.

BY JOHN S. SMITH, D. D. S., LANCASTER, PA.

Diagnosis.—Cystic tumors may be confounded with other affections which occasion swellings about the jaws, as enchondromata, sarcomata, and myxomata, abscesses, and the collections of fluids in the antrum. Dental alveo-

lar abscess may be distinguished by its acute course, and when in a chronic condition by the discharge of its contents through the fistula, either upon the gum, or within the oral cavity. The tumor formed by an abscess is never so sharply definite as is the case with cysts; with dropsy of the antral cavity the distention of the facial wall of the jaw is more uniform than it is with cysts.

In some cases of cystic tumors, they present so formidable an appearance at first sight, that they may be taken for solid tumors; especially is this so when their walls are compact and well organized, nearly if not altogether obliterating the sense of fluctuation when pressure is made upon them.

Cases have come under the observation of the writer where it required the most delicate touch to detect any fluctuation when pressure was made upon the apex of the tumor.

In some cases the diagnosis cannot be determined accurately until after one or more teeth are removed that are involved with the tumor. After such operation, a probe carried through the alveolus will usually reveal the true condition of the lesion. One or more dead teeth are found involved—one, however, being the rule in most cases which have come to the notice of the writer, while two, and sometimes three, are implicated with the tumor. The dead tooth may be easily distinguished from the living ones by its opaque appearance. Such tooth may be carious, and it may not.

Primarily the dentritic cyst originates from what pathologists call a "cold abscess," that is, an abscess which has never opened; subsequently, having developed into a tumor. The interior of the cyst has a fibrous lining, and being compact in structure, is the seat of an inflammatory process. The cyst contains a puriform fluid; it may attain such magnitude as to invest several teeth and extend beyond the alveolar process. The tumor is usually oval in shape, with its apex on a line with the diseased tooth

directly involved. The size of the tumor may be as large as a hulled walnut or as small as hazel-nut; crepitates under pressure, and feels like parchment. In cases of long standing, considerable resorption of the alveolar process takes place, and the teeth immediately connected will be loose; especially will this be the case if the alveolar borders are broken; these teeth should be removed. These tumors are found painless, as a rule. I have met with cases, however, where an acute inflammatory condition was present, with all the symptoms of acute periodontitis manifested. So that it could have been readily mistaken for the pointing of an alveolar abscess.

Pathology.—Cysts of the jaw may be either simple or compound; whether they be cysts of retention, exudation cysts, or extravasation cysts belonging to the jaws, is a matter not as yet fully established. The exudation cyst is a secretory cyst; in a generic relation, however, it is just the opposite of the retention cyst. Serous sacs form the foundations of the exudation cysts. "The mode of development of cysts of the jaws," says Wedl, "has not yet been determined; it therefore becomes necessary, in order to throw more light on the subject, to pursue further anatomical investigations in that direction."

Rindfleisch says: "The accumulation of the fluid is not produced by the continuance of the normal secretion, but by an exudation surpassing the normal measure of the serum of the blood with salts, albumen, fibrinogenous substance, and extractives, in the most varying proportions. The exudation cysts have little to do with pathological new formation. Of extravasation cysts," he says, "a parenchymatous bleeding can very well be the point of departure for the formation of a cyst. The hemorrhagic depot can present itself primarily as a cyst, namely, when the blood is poured out between two surfaces in themselves smooth; for example, bone and periosteum, cartilage and perichondrium, and thereafter remains fluid. As a cyst may also be formed when upon the one hand the liminary

parenchyma furnishes a connective tissue membrane, upon the other hand, the blood itself is resorbed through a series of metamorphoses up to a small remainder, and is replaced by a clear fluid."

The above-mentioned condition is liable to manifest itself within the body of the jaw, the bone and periosteum, after severe mechanical injuries to the bone, and the rupture of blood-vessels within the parenchyma. There can be little doubt that many of the so-called dentritic cysts of the jaws have their origin primarily from causes brought about by falls, strokes and mechanical violence, causing rupture of blood-vessels. It is quite true, history of cases fully confirms such facts.

Clinical observations leads us to believe, however, that only in cases where the abscess does not open, we find the pathological new formation taking place within the jaws. Pulpitis, and as has been observed, followed by pericementitis and periodontitis, is a prolific cause of the development of the dentritic cystic tumor.

Treatment.—The removal of all dead teeth involved. Other teeth whose pulps are living may be loose, and to a casual observer appear to be complicated, but a careful examination will reveal the fact that they should not be disturbed but retained in their places; only one tooth may be the offender, being a dead one which has caused the trouble. After the removal of the cause, let it be either one or more dead teeth or fangs of teeth, cyst walls may be punctured with a sharp instrument, and the contents of the sac released, this being done by carrying the instrument through the alveoli, and not through the bony parietes of the jaw. After the contents of the sac is let out, and the sharp spicula of bone trimmed, with engine burs, tincture of iodine full strength may be forced into the cyst sac, by saturating tufts of cotton-wool and allowing them to remain; again repeating the treatment at intervals of a day. If necrosis of bone be present, it is good practice to alternate the iodine treatment with aromatic sulphuric acid. Cases

generally yield to this treatment in from six week to three months. I have seen cases not yielding to treatment for nine months. There are other and shorter methods in the treatment which perhaps some would prefer—the cutting down through the body of the tumor, by making a crucial incision and scraping out the contents of the sac, afterwards allowing nature to do the rest—but I do not believe it is the best or safest way. There is surely a much greater loss of structure, which is never restored as in the former method by granulation, after the secreting cells have been destroyed by medicinal applications of iodine and sulphuric acid treatment.—*Medical and Surgical Reporter.*

ARTICLE V.

THOROUGHNESS.

BY L. P. DOTTERER, D. D. S.

[Read before the South Carolina Dental Association.]

Though scarcely more than a novice in the vast field of Operative Dentistry, I have gleaned sufficient experience from observation and practice to know that THOROUGHNESS is the surest means of success.

Just as the tillers of the soil sow their seeds, watch their crops, and reap their harvests, so must we do our duty, advise our patients as to the best means of preservation, and would that I could say, reap our harvest. There has been so much written upon this subject that I have nothing *new* to say, but will touch upon several points, and in giving my idea of thoroughness, as there applied, I may draw out some discussion.

The first step towards the preparation of the mouth

for dental operations is the removal of calculus and decayed fangs. Let this be done in a manner that will *insure future cleanliness*, where the proper after attention is given on the part of the patient.

As regards the preparation and filling of cavities, there are so many conflicting conditions, that we must be governed entirely by the case before us; but to be thorough in our preparation, we must so shape the cavity as to have the walls nearly plumb, uniform margin, slightly undercut. In proximal cavities there may be a groove or pit at cervical wall, but do not have it too near the margin, on account of its liability to produce fracture, and consequent failure at that point. On grinding surfaces, cut out all fissures leading into cavity, and be careful to have no angles.

The margin, after all, is the most important point; for just here failure begins, especially at the cervical wall, and care should be taken to thoroughly remove all softened structure, and aim to reach a solid foundation. These margins should be carefully trimmed and burnished, and thus our cavity is ready for the filling.

We often hear practitioners decry the rubber dam, and boast of their skillful use of the napkin; but, gentlemen, many are the failures consequent! For in deep proximal cavities, the dam is invaluable in keeping guard against oozing moisture from the gums, which, without this precaution, will flow upon the filling without our knowledge.

The dam adjusted, we proceed to form a mass of non-cohesive gold, and where the walls are strong enough, we can continue with this material throughout. But where cohesive gold is necessary, we should cover our borders, as far as possible, with soft foil; for this is more adaptable to the walls. Another advantage to be found in non-cohesive gold, is its pliability, ease of starting, and rapidity in finishing. We should thoroughly condense from beginning to end, whatever may be the kind of foil used.

Filing and finishing is too often hurried through, leaving a surplus of material at the cervical wall, or lapping

the edges—another sure cause of failure; and every care should be directed to finish in such way that an instrument passing over the line of demarkation cannot detect it. After filing, we would use pumice, either on a strip of orange-wood, or by some other convenient means, and then polish. The same general rule holds good in amalgam work, and the main cause of failure in these cases is that lack of thoroughness in finishing.

In grinding-surface cavities, where the enamel leading thereto is funnel-shaped, we often introduce too much amalgam, extending it beyond the margins of the cavity, and finishing to a fine edge. This material, when hard and bit upon, will fracture perpendicularly around the margins, giving the finishing a bulged appearance, and exposing a V-shaped crack, which will invite decay. Consequently, we should remove all surplus material, and finish at the very margin of the cavity. When gold is used, this precaution is not so necessary, as the edges of a gold filling will not fracture. Since we do not have to mallet amalgam, it is natural to suppose we don't require firm margins, but this is a mistake; and as much, or even more care should be exercised in the preparation of a cavity for amalgam than gold, as tooth-structure seems to waste away more rapidly from the former.

Let our motto be, "Whatever is worth doing at all is worth doing well." If applying arsenic or a disinfectant, cover it with gutta-percha, for the patient may be delayed a few days longer than we anticipate; and what is worse than removing a foul piece of cotton, and finding the tooth in a poorer condition than we left it? If we introduce a temporary stopping on account of exposure or frailty, let it be done thoroughly; and after relating its importance to the patient, caution her to return at a certain time for its removal and permanent filling.

We must be teachers at our chairs, if we wish the public to appreciate us, and we should instruct patients in the proper care of their teeth by an intelligent and thorough use of the brush, pick, etc.

Such is the importance of thoroughness in dental operations. This paper does not half express it, but for fear of trespassing too much on your valuable time, I commend these ideas to your criticism.—*Southern Dental Journal*.

ARTICLE VI.

WHAT FILLINGS SHOULD WE USE?

DR. W. G. A. BONWILL, PHILADELPHIA.

When I look back at my commencement and reflect that my early practice was founded on what the older men in authority had published and taught, and how I feared to do other than they demanded, I shudder at the many teeth I extracted I now know might have been saved, with even the amalgam of that day. And I tremble at the advice *now* given by the authorities that *gold* only should be used as a permanent filling. Young men knew no better, but the older do. God forgive them, I cannot. While I do not belong to the disciples of the new departure, *so far as their theory is concerned*, I stand side by side with any person *who can save teeth by plastic materials*, where gold cannot be used. Better do this than persist with gold indiscriminately, and lose teeth, rather than stoop to conquer with *any article* that is *not gold*. The public are demoralized on the subject of *gold*. "Are you not going to fill my teeth with gold?" says nearly every new customer; "Dr. ——— would not think of using anything else." A city operator must have more than the usual quota of courage to stand before the societies and state "he has been using *amalgam* more freely of late." For the first eight years of my practice I would not touch it, because Doctors Elisha Townsend and

J. D. White passed their anathemas on everything but gold and tin. I worked myself nearly to death with tin to find it preserves from caries but not from attrition. Since 1862, I have been feeling my way, and while I think I have reared many beautiful and substantial monuments of gold, and have perfected machinery with which to do it, yet I consume more amalgam than ever before.

A gold filling *properly* impacted, with cavity judiciously prepared, and the walls shaped as to forbid future decay, *will save*, irrespective of the frailty of their bony structure? But as thousands of teeth *cannot be so prepared*, both of strong and of frail organizations, and the circumstances *cannot* be controlled, we should resort to something that will enable us the more surely to meet the issue.

To enumerate the many cases of peculiar character that forbid the use of gold, would be too great a task. Physical impossibilities lie in the way of every undertaking; and it is for the successful engineer, who is well acquainted with his material, and their relative strength and *adaptability* for his purposes, to so use each, that his design will be consummated, and which shall not by future wear, prove a failure. There is a fitness in every material that experience has proven to be specially adapted for a given work, and when this general law is recognized and we become first-class engineers, we shall the better see where we can adapt our materials to the work to be done, and we can be the more certain of success, for it is founded on the logic of mechanics and physical law.

Where is the dentist that first lays out his design and orders materials best adapted for specific portions of it?

As well say everything should be made only of iron, or steel, or wood, as that every tooth should be filled with gold; or, as *equally ridiculous*, that the amalgam or some one of the plastic fillings should be the only material used.

It is not *necessary* to found a *creed or departure* on a law of *incompatibility* to tooth substance. We need not look so far into the unknown and unknowable. We poor,

short-sighted creatures must have the tangible; not a hypothesis on a *supposed theory*. Any one with half an eye can see just where the incompatibility is; not between gold and dentos, but between dentos and untutored and unskilled brain and hands to *carry out the law of adaptability*—the correlation of forces involved.

One skilled in the use of the mallet, with the rubber-dam and a substantial starting point, with walls ever so frail, can perfectly impact and complete the work in gold filling, *provided the surroundings are there*. But allow *one little vacuum* between the tooth substance and the filling, and a *capillary tube* will be formed to suck up *fermentable material*; and the *acid generated* will act on the tooth whether it be filled with gold, amalgam, oxyphosphate, or gutta percha. A thousand capillary tubes making porosity in the gold or the amalgam, will not do it; but if there is one, however small, between dentos and filling, destruction is sure.—*Transactions of the Odontological Society of Pennsylvania*.

ARTICLE VII.

SOME METHODS OF SEPARATING TEETH WITH WEDGES.

BY DR. DWIGHT M. CLAPP, OF BOSTON.

[Read at the joint meeting of the Massachusetts and Connecticut Valley Dental Societies, held at Worcester, Mass., June, 1885.]

Among the many disagreeable and annoying, not to say painful, things that patients have to suffer at the hands of dentists, nothing, perhaps, is received with greater dread and disgust than the announcement that the teeth must be "wedged" before filling. Some, a small minority among

us, I think, always fill without previous separation. In regard to the necessity for it, I will enter no argument here, but only say that personally I am a firm believer in wide spaces between the teeth at their necks, and labor to the best of my ability to obtain this result. It is most likely that many of you are using the same means that I am to get the desired room for filling, but by presenting and discussing the subject, it is possible we may obtain some help in doing what I fear the most of us find, at times, difficult and perplexing. For a long time rubber was about the only thing used for separating. It has some good qualities and many bad ones. It probably causes more pain and annoyance to the patient than any other wedge. Its liability to slide into contact with the gum, causing great pain and soreness, and even suppuration, has caused me to entirely abandon its use. I am willing to admit that it may be used successfully sometimes. The best rubber to use, if it must be used at all, is that of which the most inelastic tubing is made, or the erasers sold by stationers, cut into suitable shape. Wedges of wood are well adapted to cases where the sides of teeth to be wedged are nearly parallel, or where there is less space at the gum than at the points of the teeth. The wedge should be about as wide as the length of the crown, that is, it should extend from the cutting edge to the gum, nearly. It should be so shaped and trimmed as to not irritate the tongue or cheek. One advantage of the wooden wedge is that it is more cleanly than tape, cotton, or silk. This same class of teeth, those with nearly parallel sides, can be separated as successfully, and I think with less pain, with tape. Linen tape of various widths and well waxed is the best. It should be folded so as to be of proper width and thickness, and then drawn into place. A sharp knife is preferable to scissors for cutting off the ends. The tape should be thoroughly waxed, which assists materially in getting it between the teeth, and renders it more cleanly when left in the mouth for several days. In teeth with cavities so sit-

uated that cotton can be crowded in with sufficient force, this is one of the best wedges that can be used, as regards both effectiveness and comfort. It is necessary to so place the cotton that the force of expansion will be exerted against adjoining teeth and not expanded within the cavity. By once changing the cotton, space enough can generally be obtained. It is difficult to adjust and keep wedges in place between teeth having more or less space at the gum, and touching only at a small point near the cutting ends. It is in these cases that ligatures of various kinds serve an admirable purpose. Take for instance, the superior central incisors. These usually have but a small point of contact, with considerable space between them at the gum, and it is very difficult to put in a wedge of rubber, wood, or tape, that will not slip up against the gum, or come out altogether. If a ligature is used, the knots can be so tied that the string will clasp the point of contact in such a manner as to hold it quite firmly in place. There are many ways of making the knots; one is to pass the silk once between the teeth, then tie a surgeon's knot; but, before drawing it up, pass one of the ends again between the teeth, and then draw the knot so it will wedge from the gum towards the cutting ends; draw it closely, then finish by tying so that the last knot will be at the labial, or palatal side of the teeth. Another way is to make a series of knots like a chain stitch in crochet work, thus enlarging the silk for a suitable length; draw this between the teeth and tie as before, omitting the first knot that is drawn between the teeth. Another, and a very good way of enlarging the ligature, is, after well waxing it, to roll a little cotton around the silk as you would around a broach for wiping out a root canal, and draw this between the teeth and tie the same as when the silk is knotted. Still another method, easy of application and very effective in almost all cases where there is a cavity in one or both of the teeth, is to secure a pellet of cotton with the ligature. The silk is placed between the teeth in some of the before-mentioned

ways; a pellet of cotton is forced into the cavity, projecting against the adjoining tooth, then the silk is tied firmly around the cotton. The swelling of the cotton and silk will make all the space necessary between any of the front teeth with but one application. • The bulging of the cotton into the cavity or cavities, caused by tying the silk around it will hold it securely in place. This makes by far the most satisfactory wedge I have ever used, and, so far as I am aware, is original with me. It is sometimes well to open the cavity slightly with an excavator or chisel before wedging, so that the cotton will be more readily retained. For bicuspid and molars more than one application may be needed if much space is required. Quick wedging is sometimes possible, and when it can be done readily is usually desirable. Teeth that move easily may be separated sufficiently for operations by placing a wedge at the point of contact, and another near the gum, applying force gently with the hand, or light blows with a mallet, first on one, and then on the other, until wedged enough. Then remove the wedge that interferes most with the operation, leaving the other in place. Another way that often works well with children and with teeth that move readily, is to insert a large piece of rubber and let it remain from fifteen to twenty minutes, when the rubber will have opened a considerable space. A wooden wedge will keep the teeth from springing together while the work is being done. The appliances designed by Drs. Perry, Bogue and others, for making rapid separations, I have not used, but hear favorable reports in regard to them. Having spoken of rapid and semi-rapid separations, it is left only to speak of a method which works very slowly. It applies, as a rule, to the bicuspid and molars only. In many cases where there are large cavities between these teeth, and often, when it is desirable that they should be filled with what I think is very properly called a "treatment filling," it is well to fill the entire space between the teeth with gutta-percha. In the course of a few months the process of mastication will

force the gutta-percha toward the gum, and on removing what has not worn away the teeth will be found well separated, the cervical margins well in view, and the cavities in good condition for a metal filling.—*Archives of Dentistry.*

ARTICLE VIII.

COCAINE.

WALTER W. ALLPORT, M. D., D. D. S., OF CHICAGO, ILL.

The introduction of cocaine as a local anæsthetic, and the more general use of peroxide of hydrogen (H_2O_2) in the treatment of dental and oral diseases, are the principal advance made in the medical department of this practice during the year for which this report is made.


The two forms of cocaine which have been most generally used in surgery are the hydrochlorate and the oleate.

In operations in the mouth, involving the mucous membranes, together with the immediately subjacent tissues, these preparations have proven so efficient there is little question of its value as a local anæsthetic in such cases. But its action on deeper structures, such as involve the roots of teeth, is so uncertain as to render its practicable benefits questionable in the operation of extraction. In the surgical treatment of pockets caused by pyorrhea alveolaris, the anæsthetic effect of this agent is often so great as to render this sometimes very painful operation comparatively painless, and its employment in such cases should rarely be dispensed with. In the treatment of hyper-sensitive dentine, as well as in the removal of tooth-pulps, its action as an anæsthetic has, under some circumstances, seemed to be all that could be desired. But in far the greater number of cases it has proved of little practical value. More recently, however, a new form of cocaine, known as the citrate, has been introduced in Germany by

Merck, and is now being manufactured by McKesson & Robbins, of New York. In a series of experiments, conducted by Dr. John S. Marshall, of Chicago, it has been shown that for operations on sub-mucous tissues, or in the extraction of teeth, it seems to possess no special advantages over the preparations previously named. But when applied to dentine or the pulp, its action—though not always positive—seems to be more reliable, especially on the dentine, and gives promise of better results. Under favorable conditions it produces anæsthesia of the parts in from five to ten minutes, and the duration of the effect is of sufficient length to afford time for the preparation of the cavity. This effect has, in some cases been prolonged for more than an hour. The pulp has been extirpated without pain after the drug has been applied in from three to twelve minutes.

If the citrate of cocaine be kept in solution for more than three or four days it decomposes and loses its active properties. As introduced by Mr. Merck for dental purposes, it is made into pills by incorporating it with gum tragacanth dissolved in glycerine, each pill containing $\frac{1}{8}$ grain of the citrate. In this form it keeps well. A pill is applied to the sensitive cavity and covered with a cotton pledget, moistened in tepid water. It should be allowed to remain from five to twelve minutes, when— if at all—the desired result is produced. In twenty per cent. of the cases where this remedy has been employed it has proven unsuccessful, but it is hoped that this percentage will be reduced by a better knowledge of the drug and the improved methods of its preparation and use.

With this in view, and at the suggestion of Dr. Marshall, McKesson & Robbins are now manufacturing granules containing one-sixteenth of a grain of the citrate of cocaine, without glycerine or any other saccharine excipient, so that the obtundent may act more promptly than it can in the presence of sugar.—*Address at American Medical Association.*



Editorial, Etc.

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.—

The fourth Annual session of this institution opened with a much larger number of matriculates than ever before in its history, and the number is so rapidly increasing that the present class of seniors and juniors bids fair to be larger than any preceding one.

The reputation of this school has never been sullied by the graduation of students for fees irrespective of professional ability, and the consequence of such a course as has been steadily pursued since its organization, has been to give a professional standing to its diploma which that of no other dental school excels. The present class consists of representatives from all parts of this country, and also Germany, France, South America, Canada, and even Turkey. Many states of this country are largely represented, such as New York, Georgia, Virginia, Pennsylvania, South Carolina and Maryland especially, and also the New England states, while nearly every other state is represented.

Students who have passed a session at other dental schools have entered on a second session at the University of Maryland, Dental Department, to complete their course of study and receive its diploma, and not one of the hundreds of students who have attended a course in this institution, has ever gone elsewhere to graduate. In matriculating the present class, the resolutions adopted by the National Board of State Dental Examiners have been strictly adhered to, and many applicants of this country and Europe have been refused admission who desired to make their attendance obligatory on graduation after ONE session's attendance.

The Infirmary and Laboratory practice is not excelled in size if equalled by that of any other dental school, and the records will show hundreds of gold fillings credited to the individual practice of students for both the regular winter and summer sessions. No other school can offer greater facilities for practical instruction, nor present more complete equipments as to building and appliances than this Dental Department. Dental practitioners are cordially invited to visit the University and inspect the specimen work of its graduating classes deposited in the museum. Large and valuable contributions from all parts of this country and also from Europe are almost daily being received for the Museum, which will compare favorably with that of any other dental school for valuable pathological specimens, which are also utilized for illustrating the lectures of each course.

CORRESPONDENCE.—The following letter was received from a prominent dental practitioner of Georgia for publication:

AUGUSTA, Sept. 30th, 1885.

EDITOR "AM. JOURNAL OF DENTAL SCIENCE":

DEAR SIR: According to my knowledge of the proceedings of the organizations known as the "National Board of Dental Examiners," and the "National Association of Dental Faculties," it was determined that no dental school would be regarded as reputable that did not after June, 1885, require TWO FULL SESSIONS OF FIVE MONTHS EACH IN SEPARATE YEARS FOR GRADUATION. The only exceptions made being those who after graduation in medicine had passed one year in the study and practice of clinical dentistry, and also those who had attended a previous session at a reputable dental school. I believe that the American Dental Association also adopted the same rule. Am I not correct? I therefore ask how it is that the dental school of Vanderbilt University is permitted to offer graduation at the close of but one session, to a student of this city who has passed one session only, and that very irregularly, at the Georgia Medical College? I also ask how the same school can offer similar inducements to

another student from Edgefield, South Carolina, as I understand it has done, and yet be declared reputable? Was it for the purpose of permitting such violations of the rules adopted by the different organizations referred to, that the "National Association of Dental Faculties" allowed the dental school of Vanderbilt University to abstain from becoming a member of that Association for the present year, and accorded to its Dean the privileges of the floor at its late meeting in Chicago? I cannot see why some schools should be compelled to conform to a rule that others may violate with impunity, and I think that the State Boards of Dental Examiners of both my own state and South Carolina should investigate the matter and act accordingly.

Respectfully, &c.,

"JUSTICE."

We can only reply to the above letter by stating that several students who as we had learned from their preceptors, intended to matriculate in the Dental Department of the University of Maryland, on discovering that they would be required to attend two sessions in the institution, had, we are informed, been induced to go to Vanderbilt by the promise of graduation on one session's attendance.

EDITOR OF "AM. JOURNAL OF DENTAL SCIENCE."

Bibliographical.

A Series of Questions Pertaining to the Curriculum of the Dental Student.—Embracing Dental Histology, Dental Pathology, Dental Surgery, Dental Prosthesis, Dental Metallurgy, Dental Materia Medica and Therapeutics, Anatomy, Physiology and Chemistry. By Ferdinand J. S. Gorgas, A. M., M. D., D. D. S., University of Maryland. Publishers: W. K. Boyle & Son., Cor. Baltimore and St. Paul Streets, Baltimore, Md. 1885. Price, \$1.50.

This work comprises leading questions on all the branches belonging to the course of study pursued by the dental student, and its object is to facilitate the study of dental science and its collateral sciences.

Some years ago the author published a small work embracing in an abridged form, questions on Dental Science, and the favor with which it was received by the students of his class, was such as to rapidly exhaust the limited edition, and induce him to prepare, when opportunity offered, a more complete series of questions embracing the entire curriculum of the dental student, and even that of the medical student so far as related to Anatomy, Physiology and Chemistry.

The present work, therefore, is the result of such an intention, and is presented with the hope that it may accomplish the object for which it has been prepared.

Practical and Analytical Chemistry.—Being a Complete Course in Chemical Analysis. By Henry Trimble, Ph. G., Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Illustrated. Publishers: P. Blackiston, Son & Co., Philadelphia. 1885. Price, \$1.50.

The object of this excellent work is to place before the student of pharmacy and medicine a compact course of analytical chemistry.

The distinguished author believing that the study of Qualitative Analysis should be preceded by some practical experience such as relates to the preparation of the important gases and a few of the salts, devotes Part First to the consideration of Hydrogen, Chlorine, Hydrochloric Acid, Oxygen, Nitrogen, Ammonia, Nitric Acid, Carbon Dioxide and the preparation of such salts as Potassium Chloride, Potassium and Sodium Tartrate, Ammonium Nitrate and Oxalate, Calcium Phosphate, Magnesium Sulphate, Carbonate and Oxide, Aluminium Hydrate, Ferrous Sulphate, Ferric Sulphate and Hydrate, Copper Sulphate and

Lead Acetate. Part Second is devoted to Qualitative Analysis, and Part Third to Quantitative Analysis, together with a description of apparatus, and the processes of filtration, evaporation, crystallization, ignition, etc. The work extends over nearly one hundred pages, and is a valuable text book for the student.

Chemical Problems.—By Dr. Karl Stammer. Translated from the second German edition, with explanations and answers, by W. S. Hoskinson, A. M., of Wittenberg College, Ohio. Publishers: P. Blackiston, Son & Co., Philadelphia. 1885. Price, 75 cents.

The text is in the form of questions to which answers are given at the end of the volume, which comprises one hundred and nine pages. Part First relates to the recognized elements, and Part Second to approximate ratios, temperature, atmospheric pressure and mixed problems, making a compact and useful text-book for the study of chemical problems.

Quis Questions.—Course on Dental Pathological and Therapeutics, Philadelphia Dental College. Prof. J. Foster Flagg, D. D. S. Answered by William C. Foulks, D. D. S. Third edition, Revised and Enlarged. Publishers: The S. S. White Dental Manufacturing Company, Philadelphia, New York, Boston and Chicago.

This excellent series of questions and answers on Dental Pathology and Therapeutics is again offered to the dental profession as a work of reference in daily office practice, and is the only book that contains in a condensed and practical form the facts and principles of these subjects, as enunciated by Professor Flagg. Commencing with General Principles, these questions and answers relate to Deciduous Teeth, Pathological Dentition, Lancing, Permanent Teeth, Dental Caries, Sensitive Dentine, Galvanic Action, Pulp Protectors, Obtunding Applications, Pulp Capping, Pathological Conditions of Pulp, Dental Exostosis, Malformed Teeth, Periodontitis and Alveolar Abscess, the whole constituting a work of great value to all engaged in the practice of dentistry. The work is interleaved with blank pages for notes, etc., and gotten up in a neat and excellent style. We take great pleasure in commending this treatise as a valuable adjunct to the regular text-books of the profession.

Monthly Summary.

PEROXIDE OF HYDROGEN.—*Dr. W. W. Allport, Chicago.*

—The peroxide of hydrogen ($H_2 O_2$), though not a new remedy, has only within the last few years gained much prominence in the treatment of surgical diseases. One of its uses in dental and oral surgery is in blind or deep-seated abscesses, such as arise from roots of diseased teeth. As the tendency of pus is always downward, when these cases occur in the lower jaw it is not infrequent that the abscess, if left to itself, and sometimes even after the tooth is extracted, will point through the external tissues at the lower margin of the jaw, and occasionally downward between the muscles of the neck, and open at various points, even as low down as the clavicle. The usual treatment is to extract the tooth and evacuate the pus through the alveolus, but it often happens that the formation of pus and the continuance of suppuration is not checked, and the abscess points, or is opened through the external tissue of the face or neck, leaving, when healed, a disfiguring scar.

By injecting peroxide of hydrogen into such abscesses before they point through the external tissues, this serious disfigurement can usually be averted, and the suppurative process is materially shortened. It is also a valuable aid for the evacuation of the purulent contents of the antrum of Highmore, in catarrhal and suppurative inflammations, and especially where the sinuses are divided into two or more pockets by bony septi. These cases are often protracted by the inability of the surgeon to perfectly evacuate them. But with this preparation it becomes a simple matter after access has been gained to the cavity by the extraction of a tooth or the perforation of its external wall in the proper place at the

juncture of the cheek with the alveolar border. A free opening must always be made for the escape of the contents, in order to avoid pressure from the rapid evolution of gas. Two or three applications of a dram each is usually sufficient to completely empty the sac.

It is used with the most gratifying results in the treatment of pyorrhea alveolaris, and is an invaluable agent in treating pulpless teeth, as by its action all decomposed matter from the pulp chamber and dentinal tubuli is readily ejected, thereby removing the most frequent cause of discoloring of this class of teeth, of inflammation of the periodontal membrane, as well as alveolar abscesses.

The efficacy of peroxide of hydrogen depends on the case with which it is decomposed into oxygen and water. Pus is one of the many substances which causes this decomposition. Hydrogen peroxide acts first chemically and then mechanically. When the decomposition takes place the oxygen is set free and escapes from a liquid to a gaseous form; this expansion of the gas distends the pus cavity, and as it escapes from the orifice, it carries much of the pus with it, and its application should be repeated till all purulent accumulations are evacuated. The liberated oxygen, being in a nascent or active condition, rapidly oxidizes the products of suppuration, and destroys many of the micro-organisms of suppuration.* Hence it is a disinfectant and anti-septic.

Finally, peroxide of hydrogen, after its decomposition, leaves no material in the system which is foreign to the system, and it is, therefore, one of the most efficient and harmless disinfectants and anti-septics that can be used, in all forms of purulent inflammation.—*Address at American Medical Association.*

ALCOHOLIC PARALYSIS.—The immediate and transient effects of an excessive quantity of alcohol upon the human nervous system, whether they are manifested in the form of drunkenness, or of delirium tremens, or of an acute attack of

*See Gradle on "Bacteria and the Germ Theory of Disease," pp. 39 and 151.

insanity, are well known. Scarcely less evident are the effects produced upon the nervous system by a less excessive, but a more prolonged, abuse of alcoholic drinks. These effects may be manifested either in a general failure of physical and mental power, or in a form of disease closely resembling progressive paralytic dementia, or in various forms of chronic insanity, or in epilepsy, or in neuralgia, or in paralysis. In the acute form of alcoholic poisoning, no change in the structure of the nervous system has been found, except that the meninges in common with the internal organs and the mucous membranes are the seat of a very decided injection and slight exudation. In the chronic form of alcoholism, a number of pathological changes have been discovered in the nervous system, which, however, vary greatly in different cases.

Of late years the paralysis which results from the abuse of alcohol has been accurately described by numerous observers, and the attempt has been made to discover the lesion of the nervous system which is associated with this form of paralysis. Two cases which are reported by Dr. Henry Hun, of Albany, in the *American Journal of Medical Sciences* for April, 1885, are typical examples of this disease, and contribute to a better understanding of it.

Dr. Hun has collected the recorded cases of alcoholic paralysis, and from their study he holds that we are justified in regarding it as a special form of disease with the following symptoms: After a number of cerebral and gastric disturbances due to the alcoholic poisoning, the symptoms of the disease proper commence with neuralgic pains and paræsthesiæ in the legs, which gradually extend to the upper extremities, and which are accompanied at first by hyperæsthesia, later by anæsthesia, and in very severe cases by retardation of conduction of pain. Along with these symptoms appears a muscular weakness, which steadily increases to an extreme degree of paralysis, and is accompanied by rapid atrophy and by great sensitiveness of the muscles to pressure and passive motion. Both the sensory and motor disturbances are symmetrically distributed, and the paralysis attacks especially the extensor muscles. In addition to these motor and sensory symptoms, there is also a decided degree of

ataxia. The tendon reflexes are abolished and vaso-motor symptoms, such as œdema, congestion, etc., are usually present. Symptoms of mental disturbance are always present in the form of loss of memory and in transient delirium.

The lesion is in all probability a degeneration of the peripheral nerve fibres and of the nerve cells in the cerebral cortex, together with a chronic congestion or inflammation of the pia mater. This lesion explains well the symptoms, although it is curious that alcohol should not attack the spinal cord, but only the highest and lowest part of the nervous system, if one may so call the cortex of the brain and the terminal branches of the peripheral nerves.—*Detroit Lancet*.

NOURISHING THE TISSUES OF THE TEETH.—Dr. Frank Abbott says: For a number of years past I have entertained the views that there was some difficulty existing not due to an insufficiency of lime-salts, which occasions so many faulty and imperfectly formed teeth. With that idea in view I have advised exercise in the open air and other kinds of treatment for some patients which would favorably affect their digestion. That the food ordinarily taken contains sufficient lime-salts to form and to sustain the teeth I have no doubt (except in cases of extreme anemia, during gestation and lactation). I believe the fault is beyond that. There is a lack of proper nourishment of the tissues, due to imperfect digestion, which depends again on the proper "nerve tone." I believe this to be the real cause of the difficulty. It is reasonable to suppose that any *tonic*, whether taken in the form of exercise in the open air, or in any other form, which affects favorably other portions of the body, will affect the teeth favorably as well. When we have *ascertained the functions of the great nerve-centers*, and those functions are assured, then we will probably have more perfectly-formed teeth.—*Items of Interest*.

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ARTICLE I.

THE GEORGIA STATE DENTAL SOCIETY.

The Seventeenth Annual Meeting of the Georgia State Dental Society convened in rooms 13 and 14, of the Pulaski House, Savannah, Georgia, May 13th, 1885.

The following officers, together with a large number of members, were present and filled their respective positions:

- A. G. Bouton, of Savannah, *President*.
- S. M. Roach, of Savannah, *Vice-President*.
- L. D. Carpenter, of Atlanta, *Cor. Secretary*.
- G. W. H. Whittaker, of Sandersville, *Rec. Secretary*.
- H. A. Lowrance, of Athens, *Treasurer*.

Dr. E. Parsons, the Nestor of Dentistry in Georgia, and the oldest practitioner in Savannah, welcomed the Society in a cordial address, as follows:

MR. PRESIDENT.—The Dentists of this city have desired me to represent them in welcoming our visiting

that cement us together in professional sympathy and fraternal love, as well as to interchange opinions and aid one another in our deliberations upon the topics presented, and to advance the cause of dental science. Gentlemen, we, as a Society, and as individuals, have a very important work before us—one that demands the combined efforts of our best talents and energies. Let us labor to be contributors to the general fund of professional knowledge, while drawing upon it for that it has to give to each of us. Thus receiving and communicating, we shall advance the honors and dignity of the profession, and elevate the standard of our Society. Dentistry, in its scientific development, is making sure and promising progress; slow, perhaps, it may seem in this hurried and busy age, when haste and unrest is seen on every side, but it is not slow. While we think of the rapid strides made in population, in manufacture and commerce, in literature, in science and in art, as much as we may deplore many of her deficiencies, none have made greater progress than dentistry. Science cannot at once display all the ignorance, remove all prejudice, or rectify all the errors. The light comes, not in a noonday outburst of sudden and blinding light, but slowly, as the coming of the day. Let us rejoice, as we may, that the day is brightening and the future is illuminated with ever-cheering prospects. While the results of education are slow and almost imperceptible, they are nevertheless certain and momentous, with an all-pervading influence, like the light of day, the purified atmosphere, the gentle dews of heaven, imparting fertility to the earth and life and happiness to man. While upon the whole there has been great progress in dental education, we believe it should still be the leading interest of the profession. In its present influence, and in its relations to the future, it occupies no mean place in the category of the practical sciences and the useful arts. All subjects having a direct bearing upon our specialty should be perfectly familiar to every practitioner; and a knowledge of general medicine is indispensable to

the thoroughly qualified dentist. The great want of our profession is a higher education of those entering its doors—men trained in habits of close and independent thought; men closely and carefully trained in mental processes, and familiar with the stored-up results of the past. With such men entering our profession, every branch would be thoroughly and carefully pursued.

The trouble is, the better class of operators are too busy to take students, and the result is, they either get with those who should be students themselves or enter College without any previous preparation, and, what is worse, with a mere desire for its diploma, and no wish or thought for its honor. His whole desire is to get his diploma as easily as possible, and go out and conquer—conquering not the mysteries that will make him master of his profession; but he argues that life is short, and that he has not time to 'labor and to wait.' He has no thought for humanity; all his thinking is done in dollars and cents.

In most cases, unless the habit of close application and study is acquired before graduation, and before the vortex of business has fastened itself upon him, the man of this uncertain education will remain destitute of any ideas outside of quick operations, bad amalgam filling, and money making.

But, gentlemen, I have said enough upon this familiar subject. I desire now to say a few words regarding the effect such an Association as this has upon the individual:

First. It wonderfully expands his affectionate nature. He who sits apart in seclusion, scorning companionship with his fellow-men, necessarily becomes unloving and unlovable, dissatisfied with himself and with his neighbor, and intensely disagreeable to live with. He never feels the glow of generous emotion; never allows himself any better pleasure than cynicism. What air is to the lungs, expanding them, are friends to man. Our hearts increase in direct ratio. The more recipients the more room. A union of hands and hearts, a union of thought such as this Society affords in the

formation of life-long association; there is nothing more noble than this. Consider, also, the moral effects of such association. Man left to himself becomes morose, selfish, suspicious—finding no object of inspection outside of himself; his eyes are perpetually turned inward. When no food is furnished the stomach, its acids consume its own coating, so with this constant interspection and brooding, Not diverted by reception of fresh and varied thoughts from outside sources, it soon develops a species of insanity. As keeping the powers of the mind and heart in vigor, healthful movement, we should especially value our Society.

Again. Communing only with himself, a man becomes bigoted, dogmatic. Unaccustomed to the interchange and comparison of ideas, all his arguments, all his convictions, furnished by self-interest, he is unprepared for the reception of other thoughts; his mind is as limited as it is rigid. No persuasion or cudgelling can introduce a single additional thought. All such thoughts as are cosmopolitan—as effect communities—as bind men together in social compact, he is utterly dead to. To prevent such debasement of our powers by mutual incitement; to lift each other to grand and magnanimous planes of thinking and feeling, and acting, our Society was formed. God has placed us here on earth, in the midst of mighty and numerous influences. Man should always save for his fellow-men the best—trash he has for himself; he should be communistic, and share all his loftier conceptions with humanity. So is the world lifted. Even if he abode in his little sanctum and conversed with books, and philosophy of life would be dangerously fallacious. Man is the proper study of mankind. The only education the majority receive is from affiliation with men. The truth in physics is true in mind. Heat expands and cold contracts. The sympathetic contact of man with man opens the mind; seclusion from him warps it. Stimulated by rivalry, like blooded horses we stretch every energy to be head and head in the race.

When we measure ourselves side by side with others

after the first shock of self-conceit is over, then comes the noble aspirations to equal or excel them. There is a fire awakened in us when our views are disputed. We gather our energies for the attack and the retort. Debate is the whet-stone on which to sharpen muddy-mettled minds. Men not only accumulate power by union, but gain warmth and earnestness. The heart is kindled; an electric communication is established between those who are brought nigh and bound to one another by common labors. Union not only brings to a point forces which before existed, and which were ineffectual through separation, but by the feeling and interest which it arouses, it becomes a creative principal; calls forth new forces, and gives the mind a consciousness of power which would otherwise have been unknown. By this sympathy we may nurture a high professional honor; each one is brought under the surveillance and criticism of all the rest. By comparison of ideas, too, we take the bearings of our science; find just what each is doing; just what remains to be done. Only this is progress: otherwise we do those things we ought not to do, and leave undone those things we ought to do. Such a union of men, brought necessarily together by a common interest, in the advancement of a common profession, is a union natural, honorable and elevating. Were it not for this disposition of man to be a social being, the world would now be in barbarism. Wherever individualism reigns; wherever man but considers himself; wherever he only yields obedience to his own passions, there society becomes almost impossible. But such a state is associated with discomfort; man becomes a prey of the elements—descends to the scale of the brutes. To better himself he must join in companies, communities. Joint effort conquers nature; hews through mountains; rears pyramids. Associated with his kind, man gains dominion over the strongest animals; over the earth and sea; and, by his growing knowledge, obtains a kind of property in the universe; such is the grand principal under which we are enlisted.

I thank you, gentlemen, for your kind patience, and beg your indulgence and assistance during the session.

After this address, President Bouton called the meeting to order, and the regular order of business was taken up.

The first business transaction was the appointment of a committee to revise membership. The committee was appointed by the Chair as follows: Drs. Lowrance, Whitaker, J. P. Holmes, R. B. Adair and L. D. Carpenter.

While a recess was being taken, to allow the committee on membership to report, an impromptu clinic was held. Dr. R. B. Adair, of Gainesville, was suffering from an abscess on his left forefinger, which he wanted to have operated upon, and test the efficacy of cocaine, as an experiment. Dr. Hopps volunteered to procure the drug, and Dr. Catching to perform the operation. An extensive application of cocaine was used. In about ten minutes the abscess was lanced, and the patient, who submitted to the painful ordeal, expressed his gratification at the result.

The Executive Committee reported and recommended that the session be held from 10 o'clock A. M. until 2 P. M., daily, and clinic at 6 P. M., daily, with an additional session at night, if the business demanded it. They also submitted the names of the following for membership: Dr. J. D. Lanier, of Savannah; Dr. J. C. Bremer, of Blackshear, and Dr. J. D. Cone, of Ivanhoe. Dr. Catching acted as teller, and the candidates were elected.

On motion of Dr. J. L. Fogg, of Barnesville, Mr. G. E. Hughsly was admitted to a seat on the floor.

After report of the Executive Committee was disposed of, Dr. W. G. Brown read an interesting paper on "Electricity as a Motive Power Applied to Dentistry." He advocated the use of electricity as a motive power in dentistry. In order to get best results, a thorough knowledge of how to manage an electrical apparatus was absolutely necessary. An interesting discussion ensued, in which the members expressed themselves pro and con—electricity as a reliable motive power.

Dr. R. B. Adair read a valuable paper on "Riggs' Disease." The Doctor, having paid considerable attention to the study of this disease, presented some excellent ideas, which called forth a discussion from different members.

A discussion on "Capping Nerves" was entered into by Drs. Brown, Holmes, Fogg, Catching, White, Mason, Tignor, Adair, Smith, Parsons, Hopps and others. Various methods were presented and advocated.

On the subject of filling roots Drs. White, Smith, Catching, Fogg, Holmes, Mason and others gave their different methods.

Rubber in dentistry was discussed. A paper had been prepared by Dr. Tignor, of Columbus, but neglecting to bring it with him an outline of what he had written was presented.

A paper on "The Advantages of Gold as a Base for Artificial Dentures" was read, written by Dr. W. W. Ford, of Macon, Ga.

Dr. Catching, of Atlanta, read a paper on "Dental Literature," advocating a more liberal patronage of our dental literature, and a higher appreciation of the efforts of our leading authors. The dental journals should be patronized and encouraged.

Dr. Moncrief read a paper on "The Mouth as Presented in Every-day Practice—What Shall we do With It?"

Dr. E. Parsons read an essay on "Nervous Energy." It was a carefully prepared and interesting essay, which treated the subject in an original manner.

Dr. Coyle, read a highly entertaining paper on "Theory vs. Practice," embodying many excellent ideas.

Dr. Coyle brought up the subject of illegal practice in the State. He said there are a number of men engaged in practicing in Georgia in open defiance of the law.

The Doctor moved that the Executive Committee be authorized to draw upon the Treasurer for \$50.00 per annum, with which to prosecute those practicing illegally. The motion was advocated by others. It seemed to be

the sentiment of the delegates that the prosecuting attorneys have been too lax in the past in allowing the law to be abused. Dr Catching offered an amendment to the motion—that an individual assessment of one dollar per annum be made, if the necessity arose, aside from the appropriation. The following resolution passed:

Resolved, That the Chairman of the Executive Committee be authorized to draw upon the Treasurer of the Society to the amount of \$50.00 during the year, if necessary, for the purpose of prosecuting persons unlawfully engaged in the practice of dentistry in the State, and that we pledge the Society, collectively and individually, to an assessment, not over \$1.00 at one time, if necessary.

Dr. Parsons exhibited some plates in celluloid and rubber.

Dr. Carpenter, of Atlanta, showed some plaster models of badly deformed mouths, which he had greatly improved by treatment.

The Treasurer reported fifty one members in good standing.

The following officers were elected for the ensuing year:

President, J. H. Coyle, Thomasville, Ga.; First Vice-President, J. P. Holmes, Macon, Ga.; Second Vice-President, C. T. Osborn, Albany, Ga.; Corresponding Secretary, L. D. Carpenter, Atlanta, Ga.; Recording Secretary, W. L. Smith, Hawkinsville, Ga.; Treasurer, H. A. Lowrance, Athens, Ga.;

Executive Committee: Chairman, S. A. Bradfield, Macon; G. W. H. Whittaker, Sandersville; R. B. Adair, Gainesville; N. A. Williams, Valdosta; L. D. Carpenter, Atlanta.

Dr. W. L. Smith offered the following resolutions, which were adopted:

Resolved, 1st. That the heartiest thanks of the Georgia State Dental Society be tendered to Savannah dentists for their great courtesy and lavish hospitality; also, to the

ladies who added so much to our great enjoyment while in their beautiful city by the sea.

Resolved, 2d. That to the proprietor of the Pulaski House, Mr. Jas. M. Case, thanks be extended for the royal manner in which he cared for us, and for the beautiful parlors in which our session was held.

We tender our thanks to the railroads and places for courtesies extended and accepted by us.

The Society adjourned to meet in Macon, Ga, the third Tuesday in May, 1886. During the session the dentists of Savannah invited the members to go on an excursion to Tybee, which was most highly enjoyed by all. An elegant dinner was served during the trip on the splendid steamer engaged for the excursion. Quite a number of ladies were invited to accompany the dentists, who added largely to the pleasure of the trip.

The dentists of Savannah are royal in whatever they undertake, and the Society owe them a debt of gratitude for their efforts to make the meeting a pleasant one.—*Dental Luminary*.

ARTICLE II.

THE NERVE CENTERS AND THE TEETH.

BY J. SMITH DODGE, JR., M. D., D. D. S., NEW YORK.

The dentist need not look beyond his own field to find ample proof of nerve influence on the teeth. As regards the influence of maternal conditions during gestation on the tooth-germs of the fetus, the evidence is beyond doubt. The journals have for years contained reports in which successive children of the same mother showed

different qualities of teeth which corresponded with difference of maternal regimen. Most commonly the difference is spoken of as a varying supply of lime, the use of unbolted flour, the administration of lime-salts, removal to a lime-stone region. But these are likely also to be causes of improved general health, and so of increasing neural energy; and this view is confirmed by other testimonies which give the same results from other methods of general improvements. The members of the Odontological Society will remember Dr. Rich's account of the benefit exhibited in the teeth of children from gymnastic training of their mothers. So it looks to me plain that we are not to regard this matter as one of more or less material for tooth-building, but as concerning the ability of enamel organs and odonto blasts to work up the material at hand into perfect tissue.

But the influence of maternal organism becomes less immediate at birth, long before the permanent teeth have completed their structure; and at this we must look to the nerve-centers of the child. Now, I can hardly conceive any observing dentist doubts the influence of infantile sickness or health on the character of the permanent teeth. The various forms of atrophied enamel are now, as they have long been, considered the results of general disease during their formation; and the different qualities of dentine and of enamel, without defect of form, which so often distinguishes teeth of simultaneous development from those formed earlier or later in the same mouth, can frequently be directed traced to grave fluctuations of general health. Indeed, I am convinced that the inferiority of the first permanent molars is largely due to the general disturbances which so commonly accompany the first dentition.

A step further brings us to consider the teeth that belong to the so-called nervous temperament. When this phrase means, as it did in the old physiology, a harmonious organism thoroughly ruled by a well-balanced nervous

system, we find admirable teeth—small, a little spaced, of a dark but translucent yellow, and very enduring. But when the phrase means, as it does in popular use, a fragile organism, overridden and devoured by hypertrophied nerve-centers, we find, together with the vivacious spirit, the brilliant eye, the transparent skin, and the weak lungs, pearly teeth, which you can almost see through, beautiful while they last, but easy to cut and doomed to decay.

Thus far we have been concerned with the original formation of the teeth. But turning now to their subsequent history, we shall find numerous illustrations of our theme. We have all groaned in spirit over the teeth of children hard driven in study and pleasure. The original sensibility rises to the point of a positive neurosis, and month by month they melt like snow. We all know the destructive result to the mother's teeth during pregnancy and of the depression of vital energy which so often follows it. Something has evidently enfeebled the teeth. In New York the fashionable world dissipates all winter, and aims to recuperate in summer. I have found it a common thing that the same woman's teeth, which were fairly normal in the fall, become sensitive and decaying by spring; and I have often found the condition reversed again after a summer reasonably spent. Finally, in old age, teeth which have withstood the work of a life-time frequently succumb to rapid diffuse, painless decay, which forces on you the conviction that somehow life has half deserted these outworks and abandoned them to the enemy.*

Now, all these instances bear on the same point, namely, that whatever at any period of life exhausts or prevents the action of the great nerve-centers impairs the power of the teeth to resist the ever-present causes of decay. More might be added, but it is needless. I am convinced the nerve-centers hold sovereign sway over the formation of

*We think this is not frequent. As a rule, the teeth of the aged is not as subject to caries as the teeth of the young.—ED. ITEMS.

the tooth and the nutrition of its tissues; so that without proper and constant influence from those centers, the formative elements are unable to perfect their work, and if this sustaining power be impaired or withdrawn the teeth become an easy prey to the manifold agencies of ruin which surround them.

If these views be correct, we are confronting, in the ruinous decay of teeth, only one angle of a many sided subject; and indeed we can hardly stop short of philosophizing on the entire structure of modern society. Formerly man ruled the world by muscle and bone. The strong arm, the brawny back, the impetuosity of animal vigor made the ruling men and the ruling races. Now man rules the world by his nervous system. Clearness of understanding, tenacity of purpose, energy of will, make now the kings of men. It comes to pass, therefore, that those races rule which can put forth most forcibly and sustain longest the powers of the nerve-centers. Each man, each race, rivals the others, till we begin in our time to see a one-sided development of the best races, which is the exact reverse of what prevailed a thousand years ago, when the leaders of the world were brutal giants, ruling by bone and muscle, with intellect and sentiment shockingly atrophied. To-day the other end is up. It is brain and will that rule, dwelling perhaps in a hundred and twenty pounds of anguished flesh, tormented with dyspepsia and insomnia. That this modern man has bad teeth, and his children worse, is only a part of the same physical atrophy, the price he pays for hypertrophied nerve-centers.

I have spoken of the *man* of to-day, but the same thing is true of our women. Having within the last few generations come, into the sovereignty of the social world, how infinitely more delightful they make it by their charms of mind and sentiment than their predecessors ever did by mere force of physical charm. That is to say, they exactly parallel the man. They have replaced the former reign of beautiful flesh by a nobler reign of delicate and exalted

nerve-centers, which, as before, cultivation and rivalry push to the last extreme.

Now, when this man and this woman combine their energies for the initiation of a new life, it may easily be foreseen that their nervous systems, racked and exhausted by these perpetual struggles, will have too little latent energy remaining to endow their offspring. You cannot eat your cake and have your cake. Neither can you spend your neural force in the service of individual life and at the same time respond normally to the large demands of reproduction. It is an old observation that all unusual expenditures of brain-force tend to produce sterility. For the same reason they lower the quality of the children whose conception they do not prevent. And this deterioration, of course, follows the lead of the parental organism. Everything else is stunted (since there is not enough for all) that the nerve-centers may be largely and rapidly developed; and in the first rank of the organs which suffer is the entire dermal system, which includes the teeth. The skin itself, the hair, the nails, as well as the teeth, becomes more delicate, incapable of resistance. And presently comes the second stage of this sad, eventful history. This one-sided little creature is hardly aware of his new surroundings before parents, nurses, and friends begin to stimulate his over-grown nerve-centers, delighting in every evidence of precocity, and pushing him step by step through successive studies and pleasures far beyond his years. What city dentist has not been dismayed to hear of the school and home studies, music lessons, dancing lessons, matinees, balls, and all the rest, which make it difficult to find time for the care of this little darling's half-constructed teeth. And who has not read the end of it all in the mother's elegant mourning? The painful, perishing teeth are an integral part and a fair index of the entire physical condition.

And so we come round, through all these considerations, to perceive that the increasing frailty of the teeth is

not due to this or that matter of diet or regimen, but is part of the general fact that parents and children alike spend so much nerve-force on the world without that they have not enough left to nourish rightly the tissues within.

But it is time to ask if there be any remedy. Thanks to the marvelous recuperative power of our race, there is. I believe it may be possible, even in the individual, and certainly in the second generation, to turn inward this stream too prodigally wasted without, and utilize for self-support the vast neural power which modern times have developed. Where the income is assured it is only necessary to restrain waste, and wealth will follow. The last twenty years have made a promising beginning in the management of children in dress, diet, ventilation and exercise. But these are only the fringes of the matter. Two things remain of prime importance: First, let conception be to every wife the signal of a new, an imperative, and an honorable duty, namely, the duty to cultivate all her energy of mind and body in quiet, simple ways, and to stop all waste of nervous force, whether in pleasure, work, or worry—that the new life which feeds on her may satisfy its great requirements from an ample store. Secondly, let precocity be considered a danger to the child and somewhat a disgrace to the parent—a thing not always avoidable, but never to be desired or forwarded.

How far off may be the realization of such dreams, it would be foolish to predict. But as one who has an abiding faith in the future, I am glad to observe the beginnings of better things, and I do not hesitate to prophesy that some day all this and more will come to pass. For the present the disproportionate strain put on the nerve-centers wears out the organism that should serve all the purposes of life. The tool crumbles under the stroke. But let a few generations of proper regimen bring up the general development to match this enormous energy, and the world will see a race of men whose thought and sinew will tame the elements, and whose teeth will grind for a hundred years the food that feeds them.—Trans. Odon. So., N. Y., in *Cosmos*.

ARTICLE III.

A FACTOR IN TOOTH-PRESERVATION.

BY C. N. PIERCE, D. D. S., PHILADELPHIA, PA.

[An Address before the New Jersey State Dental Society, July 10, '85.]

Mr. President and Gentleman of the New Jersey State Dental Society:

I fear that I am trespassing a little upon your good nature in coming before you without a written essay, but my time has been so limited in preparing for this occasion that the very best I could do was to arrange some thoughts and give them to you as well as practicable under the circumstances. In answer to an inquiry from my friend, Dr. Palmer, as to the title of my subject, I wrote him that it would be a "Factor in Dental Caries," but I subsequently changed it to the more intelligible one announced by your president to-day, "A Factor in Tooth-Preservation;" and I am under obligations to my friend, Dr. Atkinson, for opening the way for me last evening, by his opportune remarks on the prophylactic influence of function, because that has been really the subject of my thoughts for the last three months, and was the point I endeavored to make in my remarks a month ago on the comparative anatomy of the teeth before the New England and Connecticut Valley Dental Associations at Worcester, Mass. What I shall endeavor to do now is simply to elaborate the remarks of Dr. Atkinson last evening, and confirm them with some illustrations of development of the teeth of the lower animals, hoping with these to leave an impression upon your minds which will not soon be erased.

First, a word or two upon dental caries. If you ask the numerous teachers in this country to formulate an answer to the inquiry, What is dental caries? they will pro

bably tell you that it is molecular death and disintegration of the tooth-tissue. We will not stop now to discuss the correctness of this answer. It is one that has been almost universally given to classes in dental schools, as well as in the meetings of dental societies. Molecular disintegration we have, but that this is preceded by death is doubtful indeed, and this one point in this pathological phenomenon is well worthy of consideration by any dental society. Many theories have been advanced by thoughtful men regarding the cause of this pathological condition designated dental caries. First, it was held that it was wholly due to chemical action; and there are men to day who take the ground that that is the only cause. They claim that there is some solvent (an acid) in the mouth which comes in contact with the tissues of the teeth, breaking up the continuity of the structures and dissolving out the lime-salts or inorganic portion. Then, there are others who take the other extreme, and assert that dental caries is the result of vital action; that through some deficiency in nutrition and other abnormal systemic conditions there is a loss of continuity between the hard or inorganic and the soft or organic structures, and in consequence of that loss of continuity the dissolution of the teeth naturally follows. Another theory is that the cause of decay is chemico-vital; that perverted or imperfect nutrition during the calcification of the hard tissues results in abnormality, both as to quantity and quality, this being a predisposing cause of caries, the teeth then becoming an easy prey of some solvent in the mouth, which is assumed to be an acid. We have, also, within the last few years, had advanced by our friends abroad as well as at home what is termed the parasitic theory—that decay is produced by certain low forms of vegetable or animal organism in the mouth, some of which, by their roots or mycelium, burrow into the tissues of the teeth and leave them in a condition to readily break down, and that other organisms, by virtue of their contact with the oxygen of the atmosphere, eliminate an acid, and in that way

we have a solvent produced by these which disintegrates the tooth-structure. These latter theories entirely overlook the fact that many of these organisms are merely mess-mates; that they live in the mouth by virtue of the pabulum on which we also live, and are not parasites at all—living on the remains of our food, on dead and refuse material, and not interfering with the live tissues in any way. Then we have still another theory, that advanced by Dr. Bridgman in England, called the electrical theory; that it is by reason of a want of correspondence in the electrical conditions of the organic and the inorganic structures that the teeth are broken down.

The fault I find with all of these theories is, not that they, or most of them, have not some grain of truth in them sufficient to warrant their advancement as elements in the problem of decay, but that it is claimed by their several and special advocates that they are *the* element. In attributing dental caries to any one of these supposed causes, we seem to entirely ignore the laws governing the development and nutrition of structures.

When a tooth is developed, it is in accordance or in correspondence with law, like other tissues. Its morphology, its structural arrangement, its density, its size, its location, all are subservient to its function and nutrition. If function is delegated to some other part or organ, nutrition is likewise diverted. Health and normality in any and every respect must be preceded by normal or natural exercise of function. The arrangement of the tissues, the size, shape, and density of the teeth are not matters of whim or accident, but are due to the natural results of the mechanical forces that have been brought to bear upon them; they are the result of the degree and direction of force that has been exerted upon them by the food habit through many successive generations; they are in exact correspondence with the amount and direction of force that has been and is exercised in the preparation of the food, or in the exact ratio of the amount of resistance offered by the trituration of the

food upon which the animal lives. This brings tooth-formation down to the single point of food habit, and in my estimation *tooth-formation and nutrition are the result of food habit.*

In the treatment of the mouths of many children we see unmistakable evidence of this absence of function. We risk nothing in saying to the mother or guardian of many of these patients that the food is washed into the stomach with one of various liquids without mastication, and we may with safety and great propriety add that, unless there is some change in the food habit of this child, our success in the direction of tooth-preservation will be but limited. Fluids must be restricted at meal time. Solid food must be substituted for the semi-solid, and the eight or ten minutes usually occupied in the consumption of a meal must be extended to twenty-five or thirty minutes. I say constantly to the parents of my young patients: If you want to save this child's teeth, you must banish drink from the table during meal time; let the children drink all they want before and after meals, but at meals the food should be taken as nearly dry as possible, and let the child spend half an hour or more in its mastication, utilizing the natural secretions; not washing down its food with copious draughts without an effort on the part of the teeth to triturate and prepare it for the subsequent digestive process. I bring up this point here because I want to make it more clear that, in my estimation, the loss of function is one great cause of this rapid decay of the teeth. The healthy or normal development of the teeth is exactly in proportion to the stimulus of the resistance that is offered to them in the cutting or mastication of food.

Now, gentleman, a recognition of the foregoing is what interests *us* as dentists, and in behalf of our *patrons* or *patients* for their own welfare and comfort. In continuation of my remarks, I hope, with the aid of these specimens upon the table before us, to show you how these various tooth-forms have been the result of jaw movements,

again, a necessity by virtue of the kind of food; and so in regular succession, we can safely say first, that food habit has been the important factor and controlling influence in shaping tooth-forms: second, that the restriction and limitation of diet has contributed to specialization of the teeth, third, the degree in which teeth are changed or modified in form and structure is in proportion to the differences in the degree of resistance to be overcome in the mastication of food.

For the sake of perspicuity, and at the risk of being tedious, let us first define a tooth, with its location, function, etc.

The definition given is, that it is a hard substance projecting from the surface of the mucous membrane; it is differentiated from the surrounding structures and opposes another tooth, or a dental plate, or else in its function works against some other substance less dense. It is located in the anterior or pre-assimilative portion of the alimentary canal, and in the mammalia it is confined to the inferior and superior maxillæ, always working in a vertical or modified vertical direction, and against other teeth or some dense substance, so as to stimulate its nutrition and health.

All teeth may be arranged into five classes. First, the simple cone-shaped tooth which is represented in the cuspid of the carnivora, the prehensile teeth of all animals swallowing their prey whole, and a large class of fishes, as well as the poison-fang of reptiles and the teeth of the sperm-whale. These are among the simplest forms of teeth found in the animal economy. The next would be a chisel-shaped tooth, examples of which we see in the incisors of the rodents and other vertebrate animals. In the third class we place the trenchant-shaped teeth seen in carnivorous animals, which shut over each other like the blades of a pair of scissors, and are for lacerating or tearing. Then come the teeth which we find in the monkey tribe, having little tubercles on the triturating surface for crushing. The fifth and last class are the molars, represented by those of the elephant and of

the rodents, but the most specialized or typical are those found in the herbivora, used for grinding grass and dry food. Nearly all the teeth of the animal kingdom may be placed in one of these five classes, by a little addition or subtraction corresponding with modifications in food habit and mandibular or jaw movement.

When we pick up a mandible that is armed with cone-shaped teeth, we know very well that its movement is limited to a vertical or up-and-down motion. The teeth in it are not for the trituration of food, but for seizing it. Corresponding with this cone-shaped tooth and the vertical motion which is found in all carnivorous animals, and which is not a mere matter of taste or accident, but of necessity, because of the class of food upon which the animal subsists, we find the shape of the condyle and the glenoid cavity to correspond—the latter hugging or so adapted to the former as to preclude any other motion. So we see that the food habit controls, not only the movements of the jaw and shape of the teeth, but the form and adaptation of the condyle and glenoid cavity.

We now take the other extreme in shape, represented by the molars of the rodents and the elephant. We find instead of the glenoid cavity a convex surface and the condyle a flat or slightly concave surface, which slides over the convex surface of the glenoid cavity; and this arrangement permits not only a lateral motion of the jaw, but the antero-posterior which is so essential to the rodent. But the food habit of the animal was the first factor or necessity which produced the lateral and antero-posterior motions, and these motions gave us the tooth-form, the condylar articulation of necessity following. We might follow this up through the whole anatomical structure of various animal, and find corresponding results in the digestive organs as well as in the modes of progression of the animals.

The teeth of the mammalia, and indeed nearly all of the vertebrata, are made up of three tissues—dentine, cement and enamel, the enamel-germs being present in all. In a

large class of animals, as in man, these tissues are arranged with the dentine in the center, the enamel covering the dentine of the crown, and the cement covering the dentine of the root. This is the common arrangement in the teeth of all carnivorous and omnivorous animals; and in these animals we find the teeth less specialized than in the herbivora and rodentia, where, instead of having the enamel covering the crown it is arranged in transverse lines running across the triturating surface, or the peculiar W-shaped pattern, by a dipping in of the enamel from the sides, as is seen in many of the herbivora. Where there is an antero-posterior motion of the jaw in connection with the lateral, we have these lines running transversely across the teeth, and with this the most complex structural condition. The object of this arrangement is patent to every one—the three tissues being of different degrees of density, and standing side by side, there will always be an uneven surface, with the most dense tissue prominent, which is most efficient in the preparation of the dry food upon which the animals subsists.

Again we recognize that this peculiar adaptation of the teeth to the necessities of the animal is the result of food habit. There is no exception to this rule. It is the force exercised upon the teeth which modifies their form and structural arrangement.

If you will bear with me a few moments, I will show you how true this is throughout the animal kingdom. Taking, first, some illustrations from the invertebrata—animals without a back-bone—their teeth are with few exceptions not dense, but shaped by food habit and jaw movement so as to be efficient in mastication. Commencing with this little animal which I hold in my hand, and with which we are all familiar, the echinus, designated Aristotle's lantern, because first described by him, we find that it has five teeth and five jaws, moved by thirty-five muscles. It subsists upon shell-fish, and by the movement of these teeth, with sharp, cutting edges, it drills a hole in the shell of its prey and sucks out the juices. The echinus is an animal with primi-

tive nervous organization, yet it has sense enough to have good taste, and by its liking for shell-fish does considerable injury to the business of the oysterman. This is one of the most complex arrangements of tooth-structure that is found in the animal economy.

Our next illustration we take from the common leech. We are all familiar with the manner in which this articulate makes its wound. The animal has three jaws, which are simple semi-circles, and are armed with teeth or denticles, not for mastication, but for cutting the flesh of its prey, and making a wound from which the animal draws the blood upon which it lives. It shows the adaptation of teeth to the necessities of the animal. The drawing upon the black-board shows the jaws attached to the second segment, and so arranged as to make a tri-radiate wound. Among the intestinal worms, I may instance the tape-worm. You all know how difficult it is to dislodge this disgusting parasite from the alimentary canal. It has a circular mouth, armed with little hooks, which seize hold of the walls of the alimentary canal, and hold fast while the animal sucks the juices upon which it subsists. In that way these hook-shaped teeth aid the animal in obtaining its nutrition.

Then we come to the mollusks, of which the varieties described may be numbered by the thousands. We may divide them into two classes, those with and those without heads. The headless ones have, of course, no teeth; while the food habits of some with heads are without the necessity for teeth, and hence they are edentulous. But in those that have teeth we find the variety in shapes corresponding with the difference in diet; so, as the little mollusk lives upon vegetable, animal, or liquid food, the teeth quite as readily correspond to its necessities as do those of the vertebrate series to theirs. So in these, again, we have this selective influence of function, giving us structures in these plastic animals which are as fully adapted to their needs as are those enjoyed by the higher animals—*teeth modified in shape substance, and arrangement by food habit*. The different

materials upon which the teeth are required to act and the different movements of the tissues in which they are implanted tend to produce that peculiar shape and structure which is most efficient for their nutrition.

Passing to the vertebrata, we have a large class of vertebrata animals whose teeth we know have been either modified or wholly lost by reason of changed food habits. Birds to-day have no teeth, yet Professor Marsh, of Boston, has described some fossil birds which were furnished with well developed teeth like those of other vertebrates. There is an immense variety of fishes, which are placed by Professor Marsh in five great classes: the leptocardia, marsipobranchii, elasmobranchii, ganoidei, and teleostei. The first of these, described by Haeckel as the acrania (without a skull), have no teeth, while the others have almost an endless variety. The marsipobranchii, of which the lamprey are examples, having pointed, horny teeth. The elasmobranchii, embracing the rays, saw-fish, sharks, etc., have teeth with sharp points peculiarly adapted to their habits of life; and so on throughout the whole series, furnishing a greater variety of tooth-formation and attachment than any other class of animals.

Before leaving the fishes I want to direct your attention to this little toad-fish which I hold in my hand. We find the body covered with spines, and a similar one in each jaw, except that their location has given them a different function, and they have become modified by virtue of it. This is an illustration of the dermal origin of the teeth, and is equally well shown by a newly-hatched dog-fish, where at this age you can scarcely distinguish the spines located on the jaw from those on the dermal surface. These, becoming modified by function, soon present a different appearance.

Next we come to the reptilia. They have but few teeth. A poison-fang is remarkable for the peculiar arrangement for conducting the poison into the wound made by it. It would be much like taking an ordinary tooth,

with the enamel and dentine on it, and rolling it out flat and doubling it upon itself, the pulp cavity occupying its normal position. In folding it over we get a semi-canal connected with the sack of poison-fluid at the end of the root. The direction of the tooth is horizontal when at rest, but when elevated to pierce the prey a membrane is drawn over this semi-tube, so that it makes a complete canal, and as the animal strikes its prey the pressure upon the sac at the root ejects the fluid through the canal into the wound made by the fang. Another peculiarity is that we have an endless succession of these fang-germs, so that when one is lost another is developed in its place. This is true of nearly all the fish series—where teeth are lost by violence or injured by wear, new teeth soon take their place.

I have here a peculiar specimen, which represents the edentata or insectivorous animals, an ant-eater, which is deficient in front teeth. The molars it has are little round pegs, made of dentine without enamel. The front teeth are deficient, yet in some of this group there is a lateral incisor, and in nearly all there are germs of both lateral and central incisors. They have not been developed for generations, yet the germ being present, represents the original idea and form of development, although it is aborted. Loss of function has greatly modified the teeth of this animal; the relegation to the tongue of the function of the incisors has made those teeth no longer necessary; hence they have disappeared, only the germs remaining to indicate the former type. The posterior teeth, having no hard substances to grind, have wholly lost their enamel; they are specialized for the services of the animal. This is not the true armadillo, although allied to that family.

As teeth are specialized by function and adapted to certain kinds of food, they are usually reduced in number; so, also, as we go up in the scale of intelligence from the lower to the higher, increased brain development seems to have a similar influence, the ancestral animal usually having had a greater number. Relegation of function brings diversion of nutrition.

Next in order comes a class of aquatic animals, which includes the sirena, or sea-cow, an herbivorous animal living in the water, and which is furnished with molars adapted to its diet. To this class of aquatic animals belongs also the spermaceti or sperm-whale, whose teeth are strong and cone-shaped, giving us the idea of prehensile use, and ranging in size in correspondence with location in the jaw, the heavier ones being located nearer the articulation. Its prey is seized and swallowed whole.

In the mysticetus, or right whale, *balænoidea* (the largest mammal), we find a set of teeth in embryo, but they are functionless and absorbed before birth. At birth, in place of teeth are developed thin plates that run transversely across the jaw, some two hundred in number, and varying from ten to twenty feet in length. These great plates, which furnish the whalebone of commerce, are attached to the upper jaw, and form a sort of a fringe on their lower edge, in which, as the animal swims through the water with open mouth, thousands of small, jelly-like animals which abound therein become entangled. The water being expelled, these are transferred to the œsophagus of the whale and become its food. These plates are an adaptation of teeth specialized to the needs of the animal, and serves it in its nutritional demands.

In the *quadrumana*, embracing the lower monkeys and lemurs, we have teeth for crushing fruits—tubercular teeth, and very closely allied to those of the human family, but somewhat different in form, and in some greater in number, the cuspids being more prominent and serving the males for weapons in combat.

Then we come to the *anthropoidea*, a group that embraces man as well as the higher apes. This group has teeth alike, save in the prominence of the cuspids; but in this ascent in the scale towards man we lose some of the teeth, the lemurs and lower monkeys having thirty-six, while the *anthropoidea* have but thirty-two. And it is a question worthy of consideration whether the frequent ab-

sence of the third molar in the human family is not in the same line of reduction; absence of function sending the nutritive current to other localities.

It is probable that, with a continuance of our present diet and manner of living, it will not be many centuries before man will have twenty-eight instead of thirty-two teeth. It is also probably that this reduction will be facilitated by the efforts of specialization, which is constant.

Man is an omnivorous animal, and in his mode of living his teeth are not subjected to the use or kind of diet which is best calculated to insure their health. If we had the opportunity of examining any large class of people who were now and had been for some centuries confined to a limited diet, with little or no animal food, we should expect to find incisors well developed, cuspids somewhat suppressed, and molars assuming a more herbivorous type, having cutting tubercles, and showing a tendency to the infolding of the enamel.

We do know that during the period in this country when the negro of the South was confined to a coarse diet he had fine incisors and strong molars. His cuspids were not more prominent than is seen in the higher races. This we should attribute to the fact of his diet being largely granivorous and coarse. You know that in all strictly herbivorous animals the cuspids are either entirely deficient or are merely present in a transitional form.

The carnivorous animals, whether aquatic, terrestrial, arboreal, or fusorial in their habits, or whether occupying the polar or equatorial regions, are alike true to their cuspids and carnivorous molars—illustrating again the influence of food habit.

The rodentia, of which this beaver is a very good type, have finely-developed incisors growing from permanent pulps, and molars with transverse lines of enamel. These forms are the result of the gnawing habit which necessitates the antero-posterior movement of the mandible. Accompanying this is also the peculiar arrangement of the three

hard tissues of the teeth, which always gives the incisors a sharp, cutting edge, by placing the enamel, which is most dense, on the external or labial surface; the dentine next, and the softer tissue, not unlike cementum, on the internal or palatine surface.

Now, Mr. President and gentlemen, I might continue these illustrations through every modification of the animal kingdom, and show you that, whenever there is a differentiation in the food habit, there is a corresponding one in mandibular movement, which is accompanied by a tooth-formation resulting therefrom, and that the condylar attachment or articulation is so constant and true to the mandibular movement and tooth-form that, when once recognized, there would be no difficulty in describing the movement of jaw and tooth-form belonging thereto.

In recognizing the conditions which induce morphological peculiarities and modifications in dental structures, we certainly have some light thrown upon a condition which might induce tooth-degeneration—in the one case functional activity, followed by healthy nutrition; in the other, functional inactivity, or the absence of function, following by diversion or relegation of nutrition to other localities.

In conclusion, gentlemen, let me once more impress upon you the importance of the influence of function as a prophylactic agent, and suggest that, in our duty to our patrons, we can render them no better service than by enlightening their understanding to this extent.—*Dental Cosmos*.

ARTICLE IV.

ETIOLOGY OF DENTAL CARIES.

BY RICHARD WHITE, L. D. S., ENGLAND.

The histological anatomy of the teeth and their environment has been so thoroughly sifted in the recent past by the aid of the microscope, that Nature can have but few secrets to reveal in this direction. The physiology of the dental tissues has been established on a more or less satisfactory basis, leaving but a limited field of enquiry for future observers, but dental pathology is as yet in its infancy, and offers a magnificent prospect for original research. Many and varied are the theories regarding the etiology of caries, greater or less weight being given to the so-called external causes—mechanical, chemical and parasitic, including the action of the food, the buccal secretions and air—while hardly sufficient attention has been bestowed on those more subtle internal agencies, developmental, nervous, vascular and trophic. Moreover, we have heretofore intermingled predisposing and exciting causes. These must be isolated and duly classified before a satisfactory scientific basis can be established. How far parasitic germs can be the *materies morbi* it is not for me to determine, but analogy suggests the probability of their being concomitant with the disease, rather than the true exciting cause of decay. The air is ever impregnated with bacterial germs, and their nourishment being deprived from the products of decomposition, the seats of decay offer a suitable *nidus* for their proliferation.

In the impaired nervous force, the altered qualitative and quantitative blood supply, and other trophic diminutions, we have what seem to be the true predisposing causes of caries. The exact point of origin of the disease may be purely accidental, arising from the agency of any one or

more of the so-called external causes, the importance of which must be therefore largely discounted. The elucidation of this complicated subject might be accelerated by experimental research, by ascertaining the results of traction, section and electrical irritation of the inferior dental nerve in animals, experimental alteration of the quantity of blood supplied to the teeth and, when possible, the quality of the same. But perhaps I am anticipating events too rapidly, so let me turn to a more general subject.

No matter connected with our profession is just now attracting more attention than the general deterioration in the structure of the human teeth of the present day. The older members of the profession especially are daily reminded of an alteration in the character of the teeth they are called to operate upon, compared with those of former years—for then usually they found a density of structure which augured well for successful operations, and the results of those operations were most satisfactory—but the teeth of the present period will seldom permit us to promise anything so favourable, from the acknowledge fact that the tissue upon which we have to operate is so defective in the combination of its constituents, although the operative skill employed has of late years immensely improved. To what is this change of structure to be attributed? This opens up a vast field for investigation.

The deterioration in the structure of the teeth which we observe is not confined to one particular class of people in the civilized world. The highly-fed and the poorly-nourished appear to suffer alike. Nor does country or climate apparently exercise much influence upon the animal economy. English, French, Germans and Americans all seem on the decline as regards the durability of these organs. The last named, probably, more than any of the other nations, which from an ordinary view of things, would be considered anomalous—for when we have an admixture of fresh blood, we naturally expect to find a more healthy condition of the progeny—for such physiological characteristics apply to animal nature in every form.

We have reasons to believe that man in a state of nature, free from the strains of mental pressure, and unattacked by the vices that accompany civilization, escapes this morbid condition of the teeth. In the mouths of the wild denizens of the back woods or the dwellers upon lands untouched by civilization, at the present day, or in the exhumed skulls of the inhabitants of this isle in the long distance past, we find well-developed maxillæ, and a bold regular arrangement of thirty-two dense teeth, generally quite free from the ravages of caries; but at the present day we meet with maxillæ extremely contracted and not admitting of the perfect arrangement of the thirty-two teeth when they are erupted. Then deficiencies in the number of teeth are often noticeably for in many cases one or both the upper lateral incisors are absent, and one or more of the upper canines, if found in the jaw, fail to make their appearance through the gum. The wisdom teeth, moreover, are very frequently absent.

This deterioration of the teeth resulting from a departure from the laws of nature, has probably existed among civilized nations for thousands of years; for it is said that the inhabitants of the ancient empires of the world paid the same penalty from a like cause, if not to the same extent as we are now doing. That caries exists in almost every mouth at the present day, and that its victims during the last few years have increased to an alarming extent, we do not doubt, for of that we have daily proofs.

A question naturally arises—what physiological cause has brought about this change of structure? For it appears to be the only portion of the human frame that has exhibited this marked deterioration.

It is not my intention on the present occasion to discuss at length this difficult subject, but to suggest points for investigation that I imagine will amply repay those who have at their disposal the time requisite for such an undertaking.

Those who have had the opportunity of examining

many cases of the teeth of persons from four generations of patients (which has fallen to my lot), will, I believe, acknowledge that the teeth in each succeeding generation, as a rule, have become more and more degenerated as regards their structure, and are more prone to be affected by caries, that the teeth of females have deteriorated much more than those of the male sex, and further, that through the female line this deterioration is much more marked than through the male line, for a mother with very defective teeth will invariably have children whose teeth partake of the same character.

Acknowledging this deterioration, may not an attempt be made to discover its cause.

That the mind of the mother exercises an immense influence over the constitution of the child when in its fetal state no one can doubt, and is it not possible that in these days of constant excitement and of general unrest among all classes, that its baneful effects may have an influence upon the rudimentary dental organs of the child at this early stage? And may not also in these days, the high mental pressure permitted, and the artificial life of early childhood continuing in rebellion against nature's laws, carry on the degenerative process that had been so early commenced?

The result of an immoral life handed down from generation to generation tells with fearful effect upon the children of such parents, and the medical treatment in former times to combat the resultant disease, if not at the present day, has had its influence upon the formation of the teeth.

The diet of children during their early years, and until the teeth are fully formed, has been considered of great importance, although in some cases where this matter has been most strictly adhered to, the result has not always, I fear, proved satisfactory. It appears to me, that much cannot be accomplished in this important subject until we are in possession of statistics for our guidance, for without such assistance we are but groping in the dark.

Would it not be possible to ascertain certain facts from our patients which might be tabulated, from which data might be obtained that might guide us, as well as our medical friends, in advising such measures as might, to a certain extent, combat the result of agencies that are at work in producing these deteriorated teeth?

Collective investigation in the hands of the British Medical Association has already largely assisted in unravelling the history of several obscure diseases, and if persevered in, will aid in furthering the rational treatment of disease as opposed to the empirical drugging of the past.

Collective investigation would eminently assist *us* in ascertaining the causes of this general deterioration in the structure of the dental tissues. We might enquire regarding, and record—

- (1) The age of patient.
- (2) The general health.
- (3) The number and general nature of the teeth.
- (4) Number diseased.
- (5) General health of parents and nature of their teeth.
- (6) If consanguinity existed.
- (7) Habits and diet of mother at time of birth.
- (8) Habits and diet of child in infancy and during juvenescence.

We thus arrive at the subject* of prophylactic or preventive dentistry, or, as it may be termed, dental hygiene, that highest scientific branch of our profession in the future, which can alone be established as the outcome of the elucidation of the causes of disease, and will tend to place us higher in the estimation of the general public than the perfecting of any other branch of our art; for they will recognize in the advocacy of its principles that splendid abnegation of self which can have but one aim—the maintenance of the health of the community. We shall then work on the same lines as our medical brethren, who seek to prevent disease as much as to combat it when already existing.—*Dental Record.*

ARTICLE V.

FOOD OF INFANTS.

BY FRED. HOOPER HAYES, D. D. S., DOVER, N. H.

The milk of the mother is the natural and only proper food for an infant. Therefore, the child should be entirely confined to it till the process of dentition has made some progress. I do not profess to be an authority, but I do feel that it is one of great interest to every practitioner of dentistry. We should be as well qualified to give advice and recommend a judicious course to be followed in this, as in any other branch of our profession. At birth the child has the germs of all the teeth. It is therefore very essential that special attention should be given to the period of gestation, and that the mother should feed on the most nourishing and lime-producing food. Much of the food that is daily consumed has lost nearly all of the phosphates so necessary for the development of the teeth and bones.

Very little attention is paid by the profession to the food of infants, and to infant hygiene. As a general rule, subject to a few exceptions, the mother's milk only will afford, during the first eight, ten or twelve months of existence, adequate nourishment, and is the best adapted to promote a proper growth of an infant's body. Food must vary in different periods of life. The infant needs a fattening diet; and this is supplied in the milk of the mother, which contains more of the butter (fattening portion) than does the milk of any other animal. The infant has much less exercise than the young of other animals, and does not require so much *azotized food*. Mortality diminishes with every day of advancing life. In the first year of life the stomach and intestines, in the second, the bronchi and lungs, are the sources of increase of the death rate.

It has ever been a problem to provide a suitable food for the young, wholly or partially deprived of its natural nourishment—the mother's milk. The nearer the substitute is to this, the better. When the milk furnished by the mother is too small in quantity, though good in quality, the infant should be supplied partly with cow's milk. By diluting it the proportion of caseine can be made to correspond with that in the mother's milk, but the proportion of albumen becomes less. Caseine is the pure curd of milk, and consists of carbon, hydrogen, nitrogen, oxygen, and a small proportion of sulphur. Albumen is easily digested, but the caseine becomes indigestible, being coagulated by the acids of the stomach. By the addition of water, the sugar, which is necessary for bodily heat, becomes less. Cane sugar will not answer, as, in order to be assimilated, it must first be converted into grape sugar by the fluids of the digestive organs, and these fluids are not secreted in sufficient quantity by infants. It also produces, by fermentation, acids in the stomach which result in irritation. The presence of albuminoids is of the utmost importance in the nutrition of infants, as well as adults. Sugar should not be given as the principal food, but as an addition to less palatable articles of diet. Milk is supplied by nature to be our first food. This fact receives but little consideration by the dental profession. It contains representatives of all the substances which make the animal frame, and it is on this account that it occupies so high a position among articles of food. It contains curd, which has nitrogen, and is equivalent to albumen and fibrine, and represents the blood formers. It has butter and sugar. These represent the heat formers. It has salts—potash, soda, phosphorus, etc.

The spontaneous acidification of the milk is caused by the fermentation of the sugar of milk, under the influence of the caseine, which results in the production of lactic acid. Lactic acid is an important constituent of the animal body, being found in the juice of muscular flesh, and in the gastric juice. Food will be valuable in proportion as it combines,

in proper proportion, the articles contained in the four groups, represented by albumen, fat, sugar, and salts.

All animal and vegetable life begins with the cell. No cell is formed without a minute particle of oil. The portion not used in forming cells is either burned to keep us warm, by uniting with oxygen, or is stored in the cellular tissue, adding to the bulk of the person. As the very beginning of life is dependent on fat, it is of importance as an article of diet. When not taken in as food, it is formed out of albumen, in the process of assimilation. Starch and sugar are never used in forming the tissue; but they perform important offices in the changes going on in the human organism. Wheat contains albumen, fat, sugar, and salts in excellent proportion. When not deprived of the bran, it is perhaps the very best supporter of animal life. For this reason it is called "the staff of life."

Scarcely anything in the form of food could be devised that is so little adapted for nourishment during the first months of existence, or more liable to produce derangement of the stomach and the infant's health generally, than the compounds of flour and milk, oatmeal and water, and the like. The powers of the infant's stomach are inadequate to digest properly the articles of food thus forced on it, and consequently results in gastric irritation, griping pains, disturbed sleep, and emaciation. The little sufferers often, too often, are forced to take more of the same food to relieve these troubles, or are given some carminative or cordial, and thus the mischief is constantly increased, till some severe disease is induced. A few vigorous children pass through these distresses produced by improper food without sustaining permanent injury to the health; often, however, the gastric irritation does not easily pass off and other dangerous maladies result. Food improperly digested results in improper fermentation and decomposition. In children it causes sour stomach and vomiting.

There is little danger to the teeth when the child is supplied with its mother's milk. But all the tissues get

just the nourishment they need. The different parts of the body require different materials for their formation and sustenance.

As a general rule, it is a duty incumbent on every mother to nourish her own infant. Occasionally the mother is incapacitated by disease, or a defect in the nutritive properties of her milk, and it becomes necessary to transfer her offspring to the care and nourishment of a nurse, or to resort to cow's milk. A course should be followed which is best calculated to produce the best results in the dental structures. When "infant's food" is added to the cow's milk, it should be one containing a sufficient quantity of the phosphates which so powerfully assist in the proper formation of the teeth and bones. The utmost care should be taken to keep the sucking bottle perfectly clean and free from acidity. The danger which attends every attempt to rear an infant by hand, as it is termed, is now very generally recognized by mothers.—*Ohio State Journal*.

ARTICLE VI.

THE NEW GEORGIA DENTAL LAW.

[Approved and signed by the Governor, Oct. 9th. 1895.]

SECTION 1. *Be it enacted by the General Assembly:*

—That from and after the passage of this Act it shall be unlawful for any person to engage in the practice of dentistry in the State of Georgia, unless said person shall have obtained a license from a Board of Dentists, duly authorized and appointed under the provisions of this chapter, to issue license.

SEC. 2. That the Board of Examiners shall consist of five (5) dental graduates or practitioners of dentistry, who are members in good standing of the Georgia State Dental Society; provided, that said graduates or practitioners have been practicing in the State of Georgia for a term of not less

than three (3) years. Said Board shall be elected to serve for two years. The President of said Georgia State Dental Society shall have power to fill all vacancies in said Board for unexpired terms.

Sec. 3. It shall be the duty of this Board, first, to meet annually at the time of meeting of the Georgia State Dental Society, or oftener, at the call of any three of the members of said Board. Thirty days notice must be given of the annual meetings. Secondly, to prescribe a course of reading for those who study dentistry under private instructions. Thirdly, to grant license examination. Fourthly, to keep a book, in which shall be registered the names of all persons licensed to practice dentistry in the State of Georgia.

SEC. 4. That the book so kept shall be a book of record, and a transcript from it, certified to by the officer who has it in keeping, with the common seal, shall be evidence in any court in the state.

SEC. 5. That three members of said Board shall constitute a quorum for the transaction of business, and should a quorum not be present on the day appointed for their meeting, those present may adjourn from day to day until a quorum is present. •

SEC. 6. That one member of said Board may grant a license to an applicant to practice until the next regular meeting of the Board, when he shall report the fact, at which time the temporary license shall expire, but such temporary licenses shall not be granted by a member of the Board after the Board has rejected the applicant.

SEC. 11. Repeals conflicting laws.

Approved October 9th, 1885.

AN ACT.

To amend Section 1416 of the Code of Georgia relating to and regulating the Practice of Dentistry in the State of Georgia, and to require Practicing Dentists to register.

SECTION 1. *Be it enacted by the General Assembly:*
—That section 1416 of the Code of Georgia be so amend-

ed as to read as follows: "That any person who shall, in violation of this Act, practice dentistry in the State of Georgia for a fee or reward shall be deemed guilty of a misdemeanor, and, upon conviction, shall be punished as prescribed in section 4310 of the Code of 1873; provided, that nothing in this Act shall be construed to prevent any person from extracting teeth; and provided further, that none of the provisions of this Act shall apply to regular licensed physicians and surgeons in practice at or prior to the passage of this Act, and dentists who were in practice prior to the 24th of August, 1872.

SEC. 2. Every person practicing dentistry in this State shall, within sixty days after the passage of this Act, register his name, together with his post-office and the date of his diploma or license, in the office of the Clerk of the Superior Court of the county in which he practices, and shall, on the payment to such Clerk of a fee of fifty cents, be entitled to receive from him a certificate of such registration.

SEC. 3. That all laws and parts of laws in conflict with this Act be, and the same are hereby, repealed.

Approved October 20, 1879.

ARTICLE VII.

VIRGINIA STATE DENTAL ASSOCIATION.

[Synopsis of Proceedings reported by Dr. E. P. Beadles, of Danville, Va. for THE AMERICAN JOURNAL OF DENTAL SCIENCE.]

The Virginia State Dental Association held its Sixteenth Annual Meeting in the City of Richmond, October 6th, 1885. Dr. Woodley, of Norfolk, presiding. The subject of the President's Annual Address was "Professional Excellence in Dentistry." The subject was well handled, and all present were well pleased as well as profited.

Dr. Thackston, of Farmville, read an excellent paper on

"Dental Education" which was highly commended. Dr. Gingrich, of Norfolk, read a paper on "Operative Dentistry." Other papers of interest were read. Clinics were held each day, and several cases of congenital cleft palate were exhibited. Cocaine and many other subjects were up for discussion. It was moved that the "Southern Dental Association" be invited to Virginia, also that the following delegates be appointed to attend its next meeting which takes place in Nashville, Tenn. Drs. Moore, Woodley, Beadles, Mahoney, Bacon, and Faucett.

The following officers were elected, by ballot, for the ensuing term.

W. H. Gingrich, of Norfolk, *President*: E. P. Parsons, of Lynchburg, *First Vice-President*: A. C. Smith, of Louisa, *Second Vice-President*: E. P. Beadles, of Danville, *Third Vice-President*: J. F. Thomson, of Fredericksburg, *Treasurer*: Geo. F. Keesee, of Richmond, *Recording Secretary*: J. Hall Moore, of Richmond, *Corresponding Secretary*.

Executive Committee: The following were selected as members of the executive committee. Drs. W. L. Bacon, T. E. Craddock, and F. A. Lee. The meeting was highly interesting and instructive to all. The Association is in a flourishing condition, there being more new members admitted this year than at any previous annual meeting. Those who have stood by the Association when there seemed little to encourage its further existence rejoice that the prospects for its future prosperity are better than they have ever been in the past.

Natural Bridge, of Virginia, has been selected as the place for the next annual meeting, which takes place the second Wednesday in August, 1886.

ARTICLE VIII.

AMERICAN ACADEMY OF DENTAL SCIENCE.

At the 18th Annual Meeting of the American Academy of Dental Science, held in Boston, November 4th, 1885, the

address was delivered by Dr. W. C. Barrett, of Buffalo. Subject.—“The Diseases of the Period of Dentition.”

The following officers were chosen for the ensuing year.

President. Dr. J. H. Batchelder.

Vice-President. Dr. C. P. Wilson.

Rec. Secretary. Dr. E. E. Hopkins.

Cor. Secretary. Dr. E. B. Hitchcock.

Treasurer. Dr. E. H. Smith.

Librarian. Dr. H. C. Meriam.

Executive Committee: Drs. Chas. Wilson, E. C. Briggs, J. S. Mason.

It was resolved that the American Academy of Dental Science learns with gratification of the re-establishment of a section on Dental and Oral Surgery in the proposed Medical Congress of 1887.

Boston, November 5th. E. E. HOPKINS; *Secretary.*

Editorial, Etc.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, D. C., 1887.—[The following are some of the more important Rules adopted relating to the preliminary organization of the Congress.—ED.]

1. The Congress shall consist of members of the regular profession of medicine, who shall have inscribed their names on the register and shall have taken out their tickets of admission; and of such other scientific men as the Executive Committee of the Congress may see fit to admit.

2. The dues for members of the Congress shall be ten dollars each for members residing in the United States.

There shall be no dues for members residing in foreign countries.

Each member of the Congress shall be entitled to receive a copy of the “Transactions” for 1887.

3. The Congress shall be divided as follows, into seventeen Sections:

- I. General Medicine.
- II. General Surgery.
- III. Military and Naval Surgery.
- IV. Obstetrics.
- V. Gynæcology.
- VI. Therapeutics and Materia Medica.
- VII. Anatomy.
- VIII. Physiology.
- IX. Pathology.
- X. Diseases of Children.
- XI. Ophthalmology.
- XII. Otology and Laryngology.
- XIII. Dermatology and Syphilis.
- XIV. Public and International Hygiene.

XV. Collective Investigation Nomenclature, Vital Statistics, and Climatology.

XVI. Psychological Medicine and Diseases of the Nervous System.

XVII. Dental and Oral Surgery.

4. The General Meetings of the Congress shall be for the transaction of business and for addresses and communications of general scientific interest.

* * * * *

8. The official languages of the Congress shall be English, French, and German.

In the meetings of the Sections, no member shall be allowed to speak for more than ten minutes, with the exceptions of the readers of papers and those who introduce subjects for discussion, who may each occupy twenty minutes.

9. The rules and programmes shall be published in English, French and German.

Each paper and address shall be printed in the 'Transactions' in the language in which it was presented, and preliminary abstracts of papers and addresses also shall be printed, each in the language in which it is to be delivered

All discussions shall be printed in English.

10. The President of the Congress, the Secretary-General, the Treasurer, the Chairman of the Finance Committee, and the Presidents of the Sections, shall together constitute an Executive Committee of the Congress, which Committee

shall direct the business of the Congress. shall authorize all expenditures for the immediate purposes of the Congress, shall supervise and audit the accounts of the Treasurer, and shall fill all vacancies in the offices of the Congress and of the Sections. This Committee shall have power to add to its membership, but the total number of members shall not exceed thirty. A number equal to one-third of the members of the Committee shall constitute a quorum for the transaction of business.

11. The Officers of the Congress shall be a President, Vice-Presidents, a Secretary-General, four Associate Secretaries, one of whom shall be the French Secretary, and one of whom shall be the German Secretary, a Treasurer, and the Chairman of the Finance Committee.

12. The officers of each Section shall be President, Vice-Presidents, Secretaries, and a Council.

13. The officers of the Congress, and the officers of the Sections, shall be nominated to the Congress at the opening of its first session.

It will be seen by the above that the Section of "Oral and Dental Surgery" has been restored to the position assigned it by the original Committee. A meeting of the Executive Committee will be held in New York, on Wednesday November 18th, 1885.

This Section as originally appointed is as follows:

PRESIDENT.—Jonathan Taft, M. D., D. D. S., Cincinnati, Ohio:

VICE-PRESIDENTS.—W. W. Allport, M. D., D. D. S., Chicago, Ill; William H. Dwinelle, M. D., D. D. S., New York City; J. L. Williams, M. D., D. D. S., Boston, Mass.

SECRETARIES.—E. A. Bogue, M. D., D. D. S., New York City; Geo. H. Cushing, D. D. S., Chicago, Ill.

MEMBERS OF COUNCIL.—W. C. Barrett, M. D., D. D. S., Buffalo, N. Y; Thos. Fillebrown, M. D., D. M. D., Portland, Me; F. J. S. Gorgas, M. D., D. D. S., Baltimore, Md; Edw. Maynard, M. D., Washington, D. C; J. H. McKellops, D. D. S., St. Louis, Mo. W. H. Morgan, M. D., D. D. S., Nashville, Tenn; C. N. Pierce, D. D. S., Philadelphia, Pa; L. D. Shepard, D. D. S., Boston, Mass; J. Truman, D. D. S., Philadelphia, Pa; James W. White, M. D., D. D. S., Philadelphia, Pa.

Bibliographical.

A SERIES OF QUESTIONS PERTAINING TO THE CURRICULUM OF THE DENTAL STUDENT.—Embracing Dental Histology, Dental Pathology, Dental Surgery, Dental Prosthesis, Dental Metallurgy, Dental Materia Medica and Therapeutics, Anatomy, Physiology and Chemistry. By Ferdinand J. S. Gorgas, A. M., M. D., D. D. S., University of Maryland. Publishers: W. K. Boyle & Son., Cor. Baltimore and St. Paul Street, Baltimore, Md. 1885. Price \$1.50.

This work comprises leading questions on all the branches belonging to the course of study pursued by the dental student, and its object is to facilitate the study of dental science and its collateral sciences.

Some years ago the author published a small work embracing in an abridged form, questions on Dental Science, and the favor with which it was received by the students of his class, was such as to rapidly exhaust the limited edition, and induced him to prepare, when opportunity offered, a more complete series of questions embracing the entire curriculum of the dental student, and even that of the medical student so far as related to Anatomy, Physiology and Chemistry.

The present work, therefore, is the result of such an intention, and is presented with the hope that it may accomplish the object for which it has been prepared.

QUIZ QUESTIONS.—Course on Dental Pathology and Therapeutics, Philadelphia Dental College. Prof. J. Foster Flagg, D. D. S. Answered by William C. Foulks, D. D. S., formerly demonstrator and instructor in the Philadelphia Dental College. Third edition. Revised and enlarged. Publishers: The S. S. White Dental Manufacturing Co., Philadelphia, New York, Boston and Chicago.

This excellent work is again offered to the dental profession for reference in daily office practice, in a revised and enlarged form which considerably adds to its value. While many, perhaps, may take issue with the "new-departure views" of Prof. Flagg, yet all will agree as to the usefulness of the work in question, and the great assistance it will afford in daily office practice as a work for reference.

Beginning with questions on general principles, it includes the treatment of pathological conditions of the teeth and adjoining structures, and ends with medicaments.

DENTAL BIBLIOGRAPHY.—A standard reference list of books on dentistry published throughout the world from 1586 to 1885. Arranged chronologically and supplemented with a complete cross-reference to authors. Compiled by C. Geo. Crowley. Publishers: The S. S. White Dental Manufacturing Co., Philadelphia. 1885. Price, cloth, \$2.00.

This work of 180 pages is a valuable addition to dental literature, and must prove of great service to the practitioner who is interested in the literature of dental subjects. It is the first attempt to furnish information, which heretofore could only be obtained with great difficulty and after long and patient research.

The compiler is certainly worthy of the thanks of the profession for such a valuable list, the collection of which entailed great labor. The publishers also should receive the credit of placing such a collection in the hands of the intelligent dentist, and for enabling the compiler to present his work in the handsome style in which it appears. The work is divided into five departments or sections. Section I contains books published in Germany, Austria, Holland, Norway, Sweden, Denmark, and Switzerland (German); Section II books published in France, Belgium, and Switzerland (French); Section III books published in Spain and Italy; Section IV books published in Great Britain and Ireland; Section V books published in America. An author's index appended in alphabetical order gives cross-reference to all the volumes catalogued. As a labor of love and not of profit, this publication should receive the high appreciation it deserves.

THE PHYSICIANS VISITING LIST—(Lindsay & Blakiston) for 1886. Thirty-fifth year of its publication. Publishers: P. Blakiston, Son & Co., Philadelphia.

Annually this useful Visiting List makes its appearance, every edition showing an improvement on the former one. The present edition contains a Calendar, List of Poisons and Antidotes, Dose Tables rewritten in accordance with the sixth revision of the U. S. Pharmacopœia, Marshall Hall's Ready Method in Asphyxia, Lists of New Remedies, Sylvester's Method for producing Artificial Respiration, with illustrations; Diagram for Diagnosing Diseases of Heart, Lungs, etc., etc., different sizes and also a perpetual edition as to dates are published of this list, and every copy contains a superior pencil with a nickel tip.

Monthly Summary.

A PECULIAR CASE.—John Thompson was ill with malarial fever, and I prescribed for him Quinia Sulphas. The most peculiar circumstance about this case was as follows; John, as a matter of fact, had to remain in the house, and as he had nothing else to do, he held their ten-months-old baby on his lap a considerable portion of the time. During the four weeks that John was sick, the baby had four teeth peep through the gums. The question at once arose in my mind, how did the quinine act to produce this result? After making a few circus rings around my bump of superlativeness, I evolved the following attenuated explanation. Naturally the child would inhale more or less of John's breath. John was taking the medicine, and of course he had a quinine-laden respiration. The child inhaled this, the quinine-germs came into contact with the gums and produced this evolution of the teeth. Or, to be more explicit, the teeth are composed of a substance that has sufficient density to produce a solution of continuity of a softer structure. The quinine-germs have a peculiar elective affinity for the teeth of children, they being rounded and located *subgumma*. The quinine-germs, being attracted by the magnetism that flows from the teeth to the food to assist in preparing it for the circulation of the liver, accumulate upon the gums over the tooth. In union there is strength, and as these germs increase in number at this place they form a powerful battery, and draw the tooth to a point, and the point pierces the solution of continuity in the gum. In the solution of this heretofore unexplained mystery we have made a wonderful discovery, and wish to call the attention of the faculty to this seeming *rara avis*.—*Cincinnati Lancet and Clinic*.

OXY-PHOSPHATE.—By E. G. Betty, D. D. S., Cincinnati.
—Under the head of "Different Materials for, and Methods of Filling Teeth," it may not be amiss to say a few words about our very good servant, oxy-phosphate of zinc.

This substance, as all are aware, is the result of a chemical union between a base and an acid; but with that part of it we will have nothing to do to-day. I am daily becoming more convinced that this material is of more service than we imagine, in this, that it enables us to ultimately save more "aching" teeth than we could were we still dependent upon oxychlorides. It is my custom to fill *all* teeth with it in which the decay has been so extensive as to nearly expose the pulp, those in which it *is* exposed, and dead teeth that have undergone conservative treatment. In case the decay has not exposed the pulp, the debris is thoroughly removed and the cavity filled with a bolus of the phosphate mixed as dry as possible; the surplus is then removed and the filling covered with wax or paraffin, or it may be given a smooth surface by polishing with heated talc. Should the pulp be exposed, remove the decay, cover the pulp with some kind of varnish, (comp. tinct. of benzoin is most excellent), flow over it a little of the phosphate prepared very thin; when this has hardened, trim and fill as in the first case. Dead teeth are also to be filled with stiff bolus. The main point in the use of the phosphate, if you wish to secure full service from it, is to allow the filling to remain as long as it will last, which, in very many cases, is about two years. Should it not remain so long, refill. The object of this is to give the tooth a *long rest*, the longer the better at the end of a year and a half or two years; large operations with cohesive foil will be borne by the tooth so treated with but a slight chance of producing either death of the pulp in the one case or recurrence of periosteal inflammation in the other.

A writer in the *Independent Practitioner* for May, recommends that a small quantity of iodoform be mixed with the thin oxy-phosphate to be flowed on exposed pulps, or immediately over the thin dentine covering one almost exposed. Though I have not tried this, yet I am inclined to think the principle is good.—*Ohio State Journal of Dental Science.*

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VOL. XIX. THIRD SERIES.—DECEMBER 1885. No. 8.

ARTICLE I.

SOME OF THE PHYSIOLOGICAL AND THERAPEUTICAL PROPERTIES OF ALCOHOL.

BY J. P. STEVENS, M. D., MACON, GA.

(Read by title at the thirty-sixth Annual Session of the Medical Association of Georgia, at Savannah, Ga., April 15, 1885.)

It is not my purpose to enter upon an elaborate exposition of the subject of my essay, as it would require too extended a monograph for its discussion in its varied relations to society. I will therefore notice only a few points of interest that bear directly upon its employment as a remedial agent in disease.

By the vast majority of physicians the properties of alcohol as a therapeutical agent are regarded as merely a diffusible stimulant without any reference to its function as a nutrient to the tissues and a sustainer of vital energy.

Its medicinal properties, however, are recognized and appreciated by the profession in general.

From the earliest historical times there has not been discovered a race of men who were not in the habit of using as a beverage some form of fermented liquors. "Wine within and oil without" seem to have been regarded as the *sumnum bonum* for attaining the highest development in the direction of physical and mental activity. It would appear, therefore, that alcohol in some form is a necessity of the animal economy. Wherein consists that necessity?

The protein compounds, albumen, fibrine and casein, form the foundation of tissue development, without which no organic growth can be accomplished. According to Lehman, the blood plasma in a thousand parts shows fibrine 4.05, albumen 78.84, fatty matter 1.72. We see therefore, that nitrogen and its compounds form the basis of organic development, and this is true not only in the animal, but in the vegetable kingdom. Now, we find the chemical analysis of alcohol to be C-4 H-6 O-2, thus showing it to be entirely destitute of nitrogen. How can something come out of nothing is the problem for solution.

Alcohol is produced by the distillation of the products of the fermentation of fruits and the grains of many vegetables. The primary products of fermentation is alcohol and carbonic acid. The further oxidation of alcohol results in *aldehyde* C-4 H-4 O, a highly inflammable volatile liquid, with a pungent, apple-like odor, which passes into acetic acid, and finally into the fermentation of mould.

M. A. Muntz declares that he has discovered traces of alcohol in cultivated soil, rain water, sea and river water and the atmosphere.

Steinmitz says: "I feel compelled to believe, in advance of Leibig, *that alcohol is absolutely generated in the digestive process of all animals*. It is well known that all the vegetables we eat contain starch; all the fruits contain sugar. Now starch can be easily converted into sugar: the process of malting is a familiar instance. . . .

The natural heat of the body is precisely adapted, in the healthy state, to effect a fermentation after having changed the starch into sugar, which last is constantly found in the blood. That alcohol has not been found seems to result chiefly from the fact that it must be sought in arterial blood, or blood which has not lost a portion of its carbon in *transitu*, through the lungs in the respiratory process."

PROPERTIES OF ALCOHOL.

Alcohol is colorless, highly inflammable, one-fifth lighter than water, a solvent of many substances that are insoluble in water, burns without smoke, and hence is invaluable in the laboratory. It has a powerful attraction for water, which causes it to absorb moisture wherever it can find it; hence its value as an anti-septic. By vaporization it is inhaled into the lungs, diffuses itself through the bronchial tubes, permeates the minute air vesicles and travels with the air vesicles into the circulating current throughout the body. Received into the stomach, it is readily taken by absorption through the veins of the alimentary surface and conveyed by the large venous trunks to the heart. Its strong attraction for water causes it greedily to drink up the moisture of the tissues wherever it comes in contact with them. Hence, the insatiable thirst for water of the inebriate after a fit of debauch. The three main sources of tissue formation and development are the albuminates, the carbo-hydrates and the oleaginous.

The albuminates are concerned in the production of the flesh, blood, bones and nerve. The carbo-hydrates are expended in the evolution of heat and the maintenance of respiration, and the oleaginous in the generation of the fatty tissue. Alcohol being destitute of nitrogen, and having an excess of hydrogen in comparison with its oxygen and carbon, is classed among the carbo-hydrates.

The theory promulgated by Leibig, forty years ago, that the union of the oxygen of the air with the carbon of the blood is the source of animal heat, and the maintenance

of the principal that the albuminates alone are concerned in tissue development, would preclude alcohol as a nutritive of the tissues. But this theory has been partially exploded, inasmuch as it is conceded that the carbo-hydrates, although destitute of nitrogen, aid the conversion of the albuminates into tissue. It is well known that in the performance of the organic functions there is a continued retrograde metamorphosis of tissue; and in wasting diseases and long continued starvation, where the equilibrium between supply and waste is not maintained, loss of strength and flesh proceed with commensurate rapidity.

Alcohol, though forming none of the constituents of blood, limits the combination of those constituents, and thus retrograde metamorphosis of tissue is retarded. In moderate quantities, a portion of the alcohol is eliminated through the secretions, and the remainder undergoes combustion for the supply of animal heat. The oxidation necessary for this combustion, without the presence of alcohol, must be expended upon the albumenized tissues to meet the wants of the economy. The amount of alcohol thus utilized by oxidation represents so much tissue saved in the process of retrograde metamorphosis, and therefore so much of conservative energy added to the general fund of force. Alcohol may, therefore, be said to act indirectly as a *nutrient* to the tissues.

Dr. Austie frequently dwells on the notable fact "that in all cases of disease where alcohol is used successfully as a medicinal support, as in the case of exhausting fevers, its presence as an alcoholic emanation, whether in the breath or in the secretions, is absent altogether, as if in those the whole force of the agent was absorbed in its operation."

He also declares "that in such instances its exciting and intoxicating powers appear to be in abeyance, and that the recovery from acute disease, when this medicine has been successfully employed, is invariably more rapid and complete than it is in altogether similar cases which have been treated without alcohol."

Alcohol may therefore be regarded as a savings bank to the tissues. Drs. Austie, Thudichum and Dupre, in their experiments upon a dog, gave it in ten days two thousand grains of alcohol, and on the last of the ten they administered ninety-five grains of the spirit. Two hours after the last dose the dog was killed, and the whole body, blood, bones, membranes, secretions and brain were subjected to vigorous analysis, and they found but twenty-three and a half grains of alcohol. "The other one thousand nine hundred and seventy-six grains had clearly, therefore, been turned to something else within the living system." Dr. Austie relates the case of an old soldier who for twenty years maintained his bodily structures in good condition with the daily consumption of a pint of gin, and "one small finger length of toasted bread." Another instance is related of a young man reduced by rheumatism, was unable to retain any nutritive substance in his stomach, and for several days was maintained by three-fourths of a pint of gin per day, and made a rapid recovery without any trace of the emaciation and prostration that usually accompany such attacks. The lad, though remarkably sober and steady in his habits while in health, exhibited no indications of intoxication while under treatment, and the abnormal frequency of his pulse and increased respiration gradually recovered their natural standard.

"Dr. D'Lalor also mentions the case of a child only fourteen months old, suffering from inflammation of the lungs, and whose stomach could retain nothing but port wine; for twelve days it subsisted entirely upon wine; it was rapidly cured with no wasting of any account; nor although it drank largely of alcohol, was it ever intoxicated."

May not the therapeutic effects of spirituous liquors, in recovering from the bites of poisonous reptiles, be ascribed to their invigorating and sustaining influence, thus enabling nature to rally her forces and lift up the heavy burden that so fearfully paralyzed her energies until she could accomplish the cure in her own beneficent way?

Dr. Richardson published an elaborate monograph on "Alcohol," wherein he makes this statement: "Alcohol cannot, by any ingenuity of excuse for it, be classed among the foods of man. It neither supplies matter for construction nor heat. It injures construction and it reduces temperature." On the contrary, Brunton avers that alcohol "undergoes combustion in the body; maintains or increases the body weight and prolongs life on an insufficient diet. It is therefore entitled to be reckoned as a food."

Richardson, prejudiced with a predominant idea, determined to maintain his assumptions at the expense of unfair experimentations. In all his experiments he is said to have administered alcohol in large and toxic doses; hence his deductions will not stand the test of fair philosophical judgment.

How many of our most dangerous mineral and vegetable poisons, when judiciously and carefully employed, are found to be our most valuable therapeutical agents. And here I may remark that there is nothing that so stultifies our intellectual faculties and contracts their operation within the narrow limits of a blind, egotistic self-assertion as prejudice against any line of thought, or the use of any medicinal agent, especially where it may have stood the test of rigid investigation and truthful experimentation.

Does alcohol lower the temperature of the body?

Dr. Parks, who has made this query a subject of careful investigations, has arrived at the following conclusions: "In healthy men who have been accustomed to take beer, and sometimes spirits, I could not detect any raising or lowering of the thermometer. Dr. Mainzer found no fall of temperature in trials on himself, but a slight fall in another healthy person. Some experiments by Obenier and Falker are also negative. We may conclude that the effect on temperature in healthy men is extremely slight; there is no increase, and in many persons no decrease. In those in whom there is a slight decrease, the amount is trifling." We may reasonably conclude, therefore, that in

moderate quantities the lowering of temperature is comparatively very little. In large and toxic doses it certainly does lower the temperature.

What are the primary effects of a dose of spirituous liquor? We observe, first, an increase in the force and frequency of the heart's action; the pulse becomes fuller, stronger, and more frequent; the vaso-motor nerves of the peripheral blood vessels become partially paralyzed; hence we have injection of the superficial capillaries; a diffused redness pervades the skin, the mental faculties become quickened, and there is a sensation of warmth diffused throughout the body. This determination of the flow of blood from the center to the circumference will be attended with increased radiation of heat from the cuticular surface, and hence it is contended by the alcholo-phobists that the superficial cooling of the blood with its return to the interior of the body will be followed by general reduction in the bodily temperature. But the equilibrium in the circulation is soon restored where the dose of alcohol has not been a large and toxic one, sufficiently so to partially paralyze and greatly weaken the tonicity of the heart's action. When subjected to the influence of severe cold until the body becomes severely chilled, every one will remember how difficult it is to secure a diffused warmth throughout the system even before a hot fire. While one side of the body is being baked the other side continues to be chilled. If, at such a time, even a small portion of spiritous liquor is drunk, it is notable how soon a genial warmth is diffused throughout every part of the body, inducing a degree of equanimity and comfort that is peculiarly grateful. The primary effects of alcohol upon the peripheral capillary system is somewhat analagous to that which we observe in what is called "taking cold." When a draught of cold air flows upon the back part of the neck of a person sitting in a warm room, the primary impression is not induced by the irritation of cold air inhaled through the nostrils, but upon the branches of the sympathetic nerve ramifying upon the scalp. This

impression produces a shock to the nerve-centre from which these nerve-fibers proceed. The nerve-centre has connections with other parts of the body, and by reflex action the vaso-motor nerves that control the vessels of the Schneiderian membrane of the nose become partially paralyzed. In consequence these vessels become dilated and engorged, and the shock which produced this congestion continuing, disturbs the equilibrium of the blood supply, and so an inflammatory condition is set up. Nature endeavors to arouse this paralyzed condition of the vessels by the act of sneezing, and thus restore the equilibrium of the circulation. Sometimes she accomplishes her purpose in a few hours, but usually the inflammatory condition is only relieved through the regular stages of recuperation observed in the process of resolution.

If the *modus operandi* of spirituous liquors, as thus considered, be correct, in what diseases are their therapeutical properties especially indicated? Evidently in those of an asthenic type, where vital energy is seriously depressed. In such diseases the retrograde metamorphosis of tissue is usually very rapid. All the excretory organs are weakened in function, and with difficulty they discharge out of the system the debris of broken-down tissue that accumulates in the blood.

In this process of metamorphosis force is lost in the action of chemical force upon the detritus of tissue. Here we have a two-fold loss of energy. If therefore, one of the functions of alcohol is to retard metamorphosis, we can readily perceive its conservative influence in economizing the powers of life, and thus indirectly aiding nature in her recuperative and curative efforts. It is notable that in all fevers the secretion of the gastric and pancreatic glands is kept in abeyance; hence, in exhausting fevers, the feeble powers of assimilation of food, and the usual disgust for food, especially of a nitrogenous kind. Now, as alcohol is classed among the carbo-hydrates, and one of the properties of this class is to aid in the conversion of the albumin-

ates into tissue, it is better to administer stimulants in company with the diet of the patient, whatever we may select. Good fresh milk combines the greatest number of nutritive elements than any other article of diet, and it is usually most digestible. Even in local inflammations and internal congestions of a passive nature, we see no contraindications for alcohol in moderate doses. Its peculiar function of determining the blood to the surface, and thus favoring the maintenance of an equilibrium in the circulation, renders valuable assistance in relieving the internal loaded blood vessels, especially in the latter stages of acute inflammation. In nervous shocks to the system, induced by whatever cause, through tramatic agencies, hysteria, moral impressions, induced by grief or fear, excessive physical or mental exhaustion, there is no agent that so rapidly rallies the sinking energies as vinous and spirituous liquors, not only on account of their rapid absorption and diffusion through the circulation, but they restore warmth to the body, and supply food for the respiratory functions.

In a state of health, during prolonged physical and mental exertion, the sustaining powers of spiritous liquors cannot be relied upon. In all competitive tests, requiring intense and prolonged muscular exertion, tea and coffee, and especially a good, wholesome, nitrogenous diet, which contains all the elements necessary for the regeneration of the wasted tissues, have always been found incomparably superior to alcohol in accomplishing the largest amount of labor. Mr. R. E. Carrington, of Guy's Hospital, in calling attention to the habits of the Cambridge crew when training for competitive prize races, writes: "It is, perhaps, one of the severest tests of muscular power that can possible occur. I find the system pursued to consist of good hours, a moderate amount of good, wholesome food, a moderate amount of stimulants, with plenty of exercise. The stimulants may consist of a pint of beer for dinner, and a similar quantity for supper. A glass or two of good port, or sound claret, are taken during the day. Even champagne is

given. Spirits are against all regulations, and are never given, for it is found that they do not tend to strengthen them in any way." It would seem therefore, that a moderate amount of fermented liquors along with food during the day is compatible with the highest development of muscular energy; but that distilled liquors do not increase the bodily strength.

So it is with their influence upon the mental faculties. It is true, that in some temperaments, the highest flights of the poet's fancy and his brightest gems of thought have been reached under the inspiration of the "wine that sparkles in the cup," but it is equally true that profound mental effort that requires severe logical induction is always hindered by the same cause. The brain-cells are stimulated to higher activity, but the thoughts become blurred, ill-defined, run into each other, and are incapable of a clear, incisive analysis. Alcohol, therefore, appears to brighten the imagination, but dulls the preceptive faculties.

It may be well to notice some of the alcoholic preparations employed as medicinal agents. Brandy as obtained, especially from the vintages of the Champagne region of France, containing fifty per cent. of alcohol, is probably the purest of distilled liquors. Gin, of all others, is the most objectionable on account of its adulteration with objectionable substances. Whisky is the most popular and the most extensively used of all distilled liquors, but it is often highly injurious from the presence of fusil oil, which is one of the most pernicious of poisons. The best qualities of wine are without doubt the most wholesome of all alcoholic preparations. It is true that the ordinary wines of commerce are often objectionable from their adulteration with foreign substances, but a good honest quality of dry wine of sufficient age to secure the completion of the fermentative process is, in my judgment, the most suitable for medicinal purposes, especially in exhaustive fevers. It is known that the *torula* plant, concerned in vinous fermentation, continues its work for years after the wine is bottled and all

access to atmospheric air is precluded. As a result, various aromatic ethers are evolved which impart the peculiar "bouquet" that renders the wine more exhilarating and acceptable to a weak stomach. On account of the objectionable nature of ordinary commercial wines, we would prefer an honest fermentation of domestic *dry* grape wine, *not less than five years old*. In long continued fevers, it may be given in quantities commensurate with the tolerance of the system and the effects produced. Its good effects will be observed when it slows, and increases the volume of the pulse, and improves the appetite of the patient. Of all wines, sherry and port, are the most objectionable. They are, for the most part manufactured with very pernicious stuffs, such as nitrous ether, sulphate of lime, tannin, alum, and other abominations. Dr. I. Burney Yeo says: "The poor man's ideal of wine is port. But of all the hurtful mixtures that are sold to the poor man, public house port is, perhaps, the worst. I need not enumerate the various substances with which it is adulterated, but many of these are astringents, and check the action of the secreting organs." The main idea in selecting a stimulant, whether vinous or spirituous, is to procure one that has completed the process of fermentation, and therefore is sufficiently aged to secure immunity from intermediate products, such as aldehyde and acetic acid. In short, a good, honest article, free from foreign admixtures, and which has been committed entirely to the laboratory of nature to finish her work in her own beneficent way, flavored with aromatized ethers, such as the ancients considered as fit libations to offer to their mythical deities.

It is not our purpose to portray the terrible effects of the immoderate use of alcohol as a social evil. This task belongs to the philanthropist. Alcohol is a double edged sword that often gleams in victorious conflict with disease and death, or cleaves the hopes and fortunes of the wise and virtuous, the innocent and dependent, and consigns to premature destruction millions of our race.—*Atlanta Med. and Surg. Journal*.

ARTICLE II.

EXCISION *v.* EXTRACTION.

BY MR. C. SPENCE BATE, F. R. S.

At a time when surgery is conservative in its treatment, and the greatest efforts are being made to retain parts that are only of secondary value, it is remarkable that in dental surgery the instruments available for the forcible removal of a tooth from its natural position have of late years so largely increased.

That many of these are intended to expedite the operation and lessen the pain, is without doubt true, but it also surely evidences a foregone conclusion, that an operation being convenient, is more likely to be determined upon.

It is now some fifty years since a Mr. Fay of Liverpool, introduced into his practice the mode of excision of the teeth, in order to obviate the pain of extraction, but as his mode of treatment was, after the operation, to allow the roots of the teeth to take care of themselves, it was found that he had to remove a large number of the retaining stumps for the purpose of getting rid of abscesses, gum boils, &c.: circumstances that induced him to return to the more common mode of practice, and extract the teeth bodily, rather than allow a portion to remain at the risk of future trouble and a second operation.

I have given this account of Mr. Fay's practice, not from any knowledge of my own, but from what I have heard when I was younger; but it should be taken into consideration that when Mr. Fay experimented on excision, the power of conserving the remaining stumps was not within the bounds of practical surgery, as it has since become.

Long before Mr. Fay attempted the excision of the teeth that are situated in the posterior portion of the jaws,

it was carried out and is still continued in relation to the teeth with simple roots, which are largely retained for the purpose of supplying the loss of their crown with an artificial substitute.

If the operation be desirable and capable of being effectively pursued in the anterior portion of the mouth, there is no reason why it cannot be as successfully fulfilled at the posterior, the only reason, as far as I can see, is that our patients generally are in accordance with us in our practice in the former case, but are largely antagonistic in the latter, which coincides with the more convenient and easier mode of preparing the jaws for the reception of substitutes than that which entails a prolonged demand on our time in the necessary treatment that the stumps may require. Another apparently satisfactory reason for the removal of the stumps is the self-satisfying argument that when they are taken out "they are certain not to pain again;" but there are other effects which an extensive series of extractions will produce that, I think, are of greater permanent evil than the risk of local disturbance that may follow the retention of an unsuccessfully treated stump or series of roots.

The amount of absorption that follows the loss of a tooth by extraction is very considerable, and when a large number are removed at the same time, the waste of osseous tissue is in a much greater ratio than in relation to the same number of teeth when extracted at various times. Nor is this the worst, for sometimes the waste goes on year after year, to certainly a less extent than at first, but so continuously that in some cases the tuberosity for the attachment of the lingual frenum may be seen conspicuously elevated as a prominent spine. Nor is this conspicuous waste of bone the worst possible feature, for in some instances the shock which the system receives is so great that it is sometimes long in its recovery. One such case has been brought to my notice within the last twelve months that terribly elucidates my meaning.

I learned from the patient herself that she had consulted me a year or so previously relative to her mouth, and that I had advised her to have no teeth removed, but some eight or nine substitutes inserted. She was then probably on a tour of professional interviews, and ultimately appears to have fixed on one who would do for her the largest amount of work for the smallest amount of payment. The result was that she had every tooth but two second lower molars extracted, and when I saw her again the alveolar ridge was wasted to a small and narrow line round the jaw, and she was wearing an imperfectly-fitting set of teeth, arising from the large amount of absorption that had gone on since the substitutes had been inserted.

One prevailing idea the patient had was that he who had extracted her teeth had ruined her for life, that he had deformed her in face and body, that she was fast becoming an unsightly person. To quote one of several letters that I received from her, soon after I had placed in her mouth another set. She writes:—

"I do not wish to trouble you with any correspondence, but I think my case needs an apology—I am grievously disappointed in the results. When I told you that I wished to be bigger, I was so pent up in the body that I could not understand for what cause I had been so treated and had so suffered.

"Now I find I am getting very stout every way, and that which had been brought almost to a climax, and which would have been very beneficial to me, has all dispersed, and in order to make me stouter I find my body and face are distorted. My nose is still waving to and fro, which I supposed is acting on my spine and causing it to be knotted and crooked. ●

"My face is all on one side, as is also my body.

"I am almost afraid to wear my teeth, the vulcanite is expanding so, and I feel that with what is going on in my mouth I am further away from having my desires realized."

The writing of one such letter as the above would be

suggestive of an exhibition of feeling arising from some annoyance connected more or less immediately with the distress induced by the novel sensation of wearing an extensive set of substitutes for the first time. But when such letters are repeated and continued for a considerable period, when, added to this, the existence of the patient has become a burden to herself and friends, that medical treatment has had no power to remove the melancholy, that she has been compelled to have an attendant in constant association with her, I think we are forced to attribute this distressing monomania as the consequence of the removal of a large number of teeth and the great immediate personal change which a considerable amount of alveolar absorption induces.

Conservative dentistry is, I believe, the better surgery, and where the roots of teeth are retained in a healthy condition the mouth is preserved in a higher degree of efficiency, both for personal appearance, ease and comfort, as well as for the satisfactory application of artificial substitutes.

Unfortunately it has been too common a practice for the stumps that are left in the mouth, being either the remains of decayed teeth or others that had been excised to admit of their replacement by substitutes, to be allowed to shift for themselves. The natural channel of the dental pulp is allowed to exist either as an open chamber to be occupied with oral deposits, or to retain the slough of the dental pulp and so pave the way to future periostitis and alveolar abscess.

Nor is the dentist wholly responsible for this condition of things, inasmuch as the general anxiety of the patient is not that the mouth shall be placed in a thoroughly healthy condition, but that the greatest amount of show shall be made for the least amount of personal inconvenience. Consequently all things like decayed stumps are allowed to take their chance, and a pus-discharging gumboil is looked upon as a valued safety-valve against active pain.

It is not my intention to raise an indiscriminate deter-

mination that no tooth or stump should ever be extracted, but I do think that neither stump nor tooth should be removed that is healthily implanted in its alveolus or could be made so. Roots that are loose, roots that are inducing induration of the periodontium, roots that are the exciting causes of a chronic inflammatory condition of the gums, or are distantly connected with obscure pains of the head and various parts of the system; teeth that are inducing irregularities in the mouths of the young, particularly when they exhibit symptoms of a rapid and overmastering decay, are such as will need the skilful application of the numerous well-made forceps, and even take the power of diagnosing when and what teeth should be retained or extracted out of the category of empirical rules.

Frequently, however, we are not consulted, and a person will rush into our operating-room and demand the immediate extraction of a fairly good organ simply because it pains. Likely as not they will pitch upon the wrong tooth, and a contest arises between the patient and his dentist as to what is right to be done, and in this, as everything else, it will be found that the stronger will prevail, for, to use the words of a patient for whom I declined to remove a sound tooth that was condemned by its owner, "The person who feels the pain is the best judge as to which tooth to refer it."

Undoubtedly there are many cases where the pain is so intense that to the mind of the sufferer the only relief is the extraction of the tooth, but in the present time, with the power in our hands of devitalizing the pulp, in a large majority of cases, perhaps in all but under exceptional circumstances, more permanent and immediate relief can be given than by extraction. For assuming the worse condition of local aggravation, the pulp being destroyed, the surrounding tissues become rapidly amenable to treatment. The tooth, ceasing to pain, can readily have the pulp-cavity and roots emptied of the remaining slough, the chamber and canals being permanently plugged, and the useless

walls reduced by excision to a level with the surrounding tissues.

The treatment of the anterior or single-rooted teeth, in consequence of their importance in restoring the natural appearance so perfectly, through the means of pivoted crowns, has long been under successful control.

The excision of one of these teeth when taken above the pulp chamber is comparatively a painless operation, in many cases the entire pulp coming away with the amputated portion; the root on being plugged either with the pivot of the newly adapted crown, or by means of any water-tight plug, becomes a restoration of the parts more natural and more permanently normal than can be produced by extraction under the most favourable circumstances.

That which has been done so frequently and so successfully for the teeth with a single pulp canal is also capable of being done with teeth of a larger number of both roots and canals. Undoubtedly the molars are larger and stronger organs, and the excision of their crown, if tolerably firm, might require a greater hand power than every dentist possesses; for the slightest deviation from rigid firmness and steadiness of hand is liable to dislocate the tooth in its socket, to give intense pain, and an after irritation that not only may require a prolonged treatment, but probably vitiate the success of the operation altogether.

The compound character of the pulps of the posterior teeth is another source of difficulty, for it is scarcely probable that the excising power shall be so equally distributed that the branches of the pulp which traverse the different roots shall be simultaneously severed; consequently the force that ruptures the pulp of the anterior root of a molar tooth may only stretch that of the posterior, which, being done for the smallest amount of calculable time, must induce exquisite pain.

It appears to me, therefore, that the devitalization of the pulp previously to the removable of the crown is a

thing to be desired, and the excision should be by a series of cuts, rather than by a single operation.

The roots of the excised tooth being clean and healthy, the pulp chamber and canals being carefully and hermetically sealed, the alveolar processes of the jaws are preserved and the mouth is retained in a condition more in accordance with its natural appearance, and less liable to vary for a long series of years than when the teeth are entirely removed.

I am aware that many practitioners advocate this mode of practice as conscientiously as their patients will admit of their doing; but I think that it would largely advance the power of their advice and give increased confidence to their treatment if the subject received a full discussion by the profession, and it went forth as the dictum of this society, that the roots of teeth retained in a healthy condition is a thing to be desired, and that the preservation of the alveolar walls is synonymous with a youthful and healthy expression of the face.—*The Dental Record*.

ARTICLE III.

PULPLESS TEETH.

BY CHAS. F. IVES, M. D. S., NEW YORK.

I have no intention of going over any portion of the ground so repeatedly and thoroughly trodden by others on this subject, but rather to offer a few thoughts which have been suggested to my mind after reading the articles in the *Medical Record* and listening to remarks from different members of the dental profession in reply.

Entirely agreeing with the verdict that physicians generally are far from being well posted in diseases of the teeth,

I still could not help wondering *why* these articles were written—what motive prompted them. Surely it was not from any desire to snub us as a profession—not to gratify any personal antipathy, and not altogether the result of clinical observations. Back of all this there must have been some honest convictions which led to the attack. Perhaps, a succession of unpleasant experiences, the result of slow and wearisome endeavors to find a cause for certain pathological conditions, the tracing of which through avenues leading to one common center, resulted in certain convictions, convictions so strong as to overlook the fact that under other conditions than those existing, the result might have been different. For instance, if in their private practice they met with cases which baffled them in diagnosis and treatment, and after having almost exhausted their skill in the vain attempt to get at the *cause*, they at last get at the *fact*, that there is at times, an uneasiness, an occasional approach to pain, sufficient to be acknowledged if persistently questioned in regard to it, and which seems to lie in or about the oral cavity. This general uneasiness is at last traced to a pulpless tooth, which has been treated and filled, or quite as often, to one in which the attempt has been made to cap an exposed pulp, or a metal filling was laid in too close proximity to it. Extraction of the tooth at once removes all the troublesome symptoms for the alleviations of which the physician was consulted. A few experiences of this kind would naturally lead many physicians to the conclusion that teeth deprived of their pulps were very like slivers in the fingers, foreign bodies, and the sooner they were removed the better. I have more than once heard this assertion from the medical fraternity. Can we, looking at it in this light, conscientiously blame them? We *know* that if pulpless teeth are brought to a healthy condition, and their roots filled as well as it is possible to do it, the cases in which trouble supervenes are reduced to a minimum, and there is no necessity for consultation with the physician in regard to any trouble for

which they are responsible. Now the point I am after is this. What proportion of pulpless teeth are honestly, conscientiously and intelligently treated and filled by the dentist? Of how many of these teeth coming to him for treatment can he say, after finishing his work, I have done my best regardless of time or remuneration. This is the serious side of the subject for us. To further illustrate let me give the history of a single case.

A gentleman on his way to have a first superior molar extracted, suddenly thought better of it. and came to me for temporary relief, which having afforded him, he volunteered the following statement in regard to it. Some four years before, he put himself in the hands of a dentist in New York, who found in this tooth, an exposed pulp which he destroyed in the usual way. The tooth had a large gold filling in its crown, but the application for destroying the pulp, and the subsequent treatment was made through a cavity in the posterior approximal surface. In due time, the dead pulp was removed from its chamber, and attempts made to enter the root canals. The palatal root offered but little difficulty apparently, but the buccal roots proved more of a task, and after many vain attempts, the dentist assured him that they were entirely closed with a deposit of secondary dentine. The palatal root was dressed, and a temporary stopping inserted. From this time on the tooth was troublesome, a continuous nagging uneasiness was present which no applications seemed to relieve. Sometime after this, the patient passed into the hands of another dentist, who drilled through the crown filling, thus obtaining more direct access to the roots. Treatment was resumed with but little improvement, and the tooth was finally filled with gutta percha, with the advice to have it extracted if it proved troublesome. This was its history when he came into my hands. I removed the entire filling in the crown, enlarged the opening until I had perfectly free access to all of the roots. I found the entrance to both buccal roots, enlarged them and followed them up till their extreme minuteness

and entire freedom from odor convinced me that there would be no further trouble from them. The palatal root was in a bad condition and undoubtedly the seat of the whole trouble, as the end of it had never been reached. It was stubborn under treatment, and carbolic acid or iodiform left in it for a few days would thoroughly lose its identity. I therefore without hesitation went through the foramen with a drill made from a Donaldson bristle. A call for pus was made with the peroxide of hydrogen, and promptly responded to and from that time on it has continued to improve, and will, I trust, soon be in condition to fill permanently. Well, what of it? Simply this: Do you not honestly believe that if the dentist who destroyed the pulp in that tooth, had removed the crown filling, obtained free access to the roots, given them such treatment as was necessary and filled them, it would probably never have given trouble? Could we naturally look for success to follow the endeavor to reach the anterior buccal root of a superior molar through a posterior approximal cavity, or to do effectual service in any of them.

It is just such kind of imperfect operations as this that send not a few to the physicians with suspected neuralgias and other neuroses. It is the results of just such operations that occasionally get reported in the medical journals, with an editorial fling at the end to the effect that "Dentists should remember that the treatment of diseased tissues require a medical education." I have seen during the past winter enough of careless, unprincipled work performed on this class of teeth, by men who claim to stand high in the profession, to warrant wholesale denunciation. The time is coming when the cry of mal-practice will mean business to those who are unwilling to spend the time necessary on diseased teeth, because it does not bring them the same remuneration as ordinary operations.

It needs a great deal of patience, a great deal of good temper, and a large amount of persistent determinative energy to successively treat a refractory pulpless tooth.

No operation draws more heavily on the nervous system, for it often discourages while it wearies, and it is at such times that the tempter draws near, and one needs all his strength to say "get thee behind me." If we are unwilling to give our best efforts in this special line of work, if we believe that it does not pay to devote the time and thoroughness to it necessary for the best results, then let us believe that the physicians are right, and that extraction is the best thing, and not stand up and pity their ignorance. If on the other hand we strive with all honesty of purpose to do the best we are capable of doing, we assuredly shall prove, in a large degree, successful; and not only enjoy the consciousness of a duty well done, but be able to convince our medical friends that pulpless teeth can be made very quiet and respectable members of oral society though slightly crippled.

Before concluding I cannot resist having my little say in regard to the different materials used in the filling of root canals. In a practice of twenty-five years I have naturally had occasion to remove quite a number of root fillings, re-treat and re-fill them, and whenever I have had the privilege of obtaining an extracted tooth with the roots filled, I have sat down with keen delight to a careful dissection of it, hoping to profit from the success or failure of the operator. I have never yet, in the root or roots of a tooth, in or out of the mouth, found a filling of gutta-percha, metal of any kind, wood or paste, that did not on removal give out more or less of vile odor. That it is possible to fill a larger proportion of roots more perfectly—so far as adaptation is concerned—with a solution of gutta-percha in chloroform than with any other material, I am inclined to believe; but that it can be made impervious to emanations from the tubuli or through the foramen, I do *not* believe. The fact that those who use it and claim that they never have any trouble, is no proof to the contrary. I had occasion some time ago to re-fill the crowns of two superior bi-cuspids, the roots of which had been filled with cotton and creosote

some thirteen years before. They had never given the slightest trouble, but my curiosity getting the better of me I removed the fillings, finding it, however, no easy task, for they had evidently been packed on the principal of a cotton bale. As each bit was removed, it was passed in close proximity to my nasal organ, and to the very end it was sweet and redolent of the antiseptic. I therefore put it down that cotton and creosote could be *made* to answer a good purpose, and in this case back it went. In my hands nothing has been so uniformly successful as a slow setting oxy-chloride of zinc, mixed to a moderate degree of stiffness and with a fibre or two of cotton to make it carry well; first closing the foramen with a bit of cotton moistened with carbolic acid, or if the opening is large, with tin foil. With this, a root can be thoroughly filled and rendered aseptictic to any secretions. I have no sympathy with that mode of practice which goes upon the principal that all root fillings should be tentative in their character, and therefore filling them in a manner and material to be easily removed in case of trouble arising, or providing a tap or vent-hole. I would far rather bend all my energy to get the roots in a healthy condition, and when my judgment assured me they were so, fill them as I would a cavity, to the best of my ability and never stop to think that they would do otherwise than well.

M. L. Rhein: There is but one point in the paper that I wish to speak of, and that is in regard to what the essayist says about gutta-percha fillings. I believe a root can be perfectly filled with gutta-percha and neither cause trouble nor give forth the slightest odor. I have removed many a gutta-percha filling and have yet to detect any odor. I know that this depends a great deal upon the manner in which the root is filled, but I think gutta-percha better in any case than anything else that can be used. To fill a root with gutta-percha it is necessary to reach the very apex, and to know that the root is in a perfectly healthy condition—be convinced that there is no further trace of

putrefaction. I then introduce a little alcohol into the cavity, and having my lamp handy, I dry the root out very thoroughly by means of the hot-air syringe, so that it is warm, and then I introduce the gutta-percha solution upon a platinum point. The canal is in this way thoroughly dried and the tubuli are in condition to take up the chloroform solution. I fill about half the root in that way, and the tooth temporarily with oxy-phosphate.

I do not mean to say that other materials will not perfectly fill teeth roots. I suppose there are a hundred ways of doing it successfully; but I am sure that gutta-percha can be used in a root, and the operation made a success, and I don't want it to go out that this is not the case.

Chas. F. Ives: I believe I stated that other material could be used and as perfectly as that to which I gave the preference; but you cannot make a gutta-percha filling that will not absorb; it will stink to the end of time.

M. L. Rhein: Where would it absorb, through the apex?

Chas. F. Ives: Through the apex and tubuli.—*Dental Society of State of N. Y.—Odontographic Journal.*

ARTICLE IV.

THE AMALGAM QUESTION.

BY J. HARDMAN, OF MUSCATINE, IOWA.

Within the limits of a magazine article, it is impossible to use detail, or much tabulated formula upon such an extensive question as the manufacture of alloy for dental purposes, and the modes of using the same as amalgam in the treatment of carious teeth, etc.

I will at present merely attempt to offer some points

for consideration seeming to have at this time, more or less especial interest to the practicing dentist. For the reader wishing fuller detail, and at the same time, the best obtainable authority, I can, with confidence, recommend Prof. J. Foster Flagg's work on "Plastics and Plastic Fillings," issued in 1881. In this work he will find much valuable information; being the most complete work upon plastic agents, and especially upon amalgam for dentists' use ever presented to the dental profession.

As time advances experience in the manufacture and in the use of amalgam for filling carious teeth, for crown work, for repairing rubber or celluloid plates, etc., is assuming a magnitude of almost universal interest. The prejudices of the former many, and the obstinacy of the still remaining few who offer opposition to filling teeth with amalgam, leaves the discussion of this question fully in accord with legitimate professional honor.

Its use for a half century, attended during the time with marked improvements, fully vindicates its worth by the thousands of teeth saved and the warm gratitude of the possessors.

The making of a *good* alloy for filling teeth, is one requiring more skill, knowledge and care than is usually imagined.

The essential properties, or rather characteristics, such as workable plasticity; suitable speed of crystalization; efficient hardness; non-shrinkage and non-expansion; of suitable color; will make good sub-marine work, and will not be too expensive, are qualities in number and value, that must strike any one capable of the comprehension of the subject, as not to be secured without much persistent labor and untiring thought.

There are three cardinal principles to govern in the making of a suitable alloy for dental amalgam.

1. Metals used should each have an affinity for mercury.
2. Those selected should be benign to tooth structure

3. The quality of expansion of some metals, and of contraction of others while being made into amalgam must be so regulated that the combination will harmonize these extremes so as to form a non-shrinkable and a non-expandible compound.

Silver, tin, gold, copper, zinc and some other metals readily unite with mercury, when they are in fine separation and some friction and pressure is used. And each of these formed into an amalgam has a characteristic of its own.

The first four named enter into nearly all the best alloys found in the market; while the two first, forms much the largest ingredients in any dental alloy.

Tin in excess will lack hardness; will have a tendency to "ball" and draw away from the walls of the cavity. Silver in excess will contract and tend to leakage. Gold in excess will interfere with crystalization and strength. Copper, though invaluable in correcting contracting and securing the required edge strength, if in excess, will cause too much discoloration. Of zinc a very little is enough; and if properly managed greatly aids in preventing discoloration.

I cannot, from my experiments, find any good results from platinum in any quantity. Believe it will be found so, in an effort to use any metal which seems to have such a disfavor with mercury. Probably in most cases the use of platinum in alloy is the result of a supposed or imaginable good; or in some a means to captivate trade. I am sorry I am unable to adduce a better reason. To call a compound by a name of an ingredient that forms but one one-hundredths or one four-hundredths part of its composition seems ridiculous. And even that little is useless: If useless, then how well that the quantity is infinitesimal.

The mere combination of metals while in a fused state does not always secure the best results obtainable from a good formula.

If in a four metal alloy a division is made—two malts, and two ingots are made, each differing in quantities of its relative components, then cut separately and afterwards the

two alloy fillings intimately mixed; it will be found that its properties when made into an amalgam is very different from that made where all the metals, of the same formula, were melted into one ingot and so cut and used. This after mixture of two alloys, each differing from the other, but in the aggregate being a same selected formula, produces a different molecular result, and opens a field for further experiments and better results.*

There is a strong tendency to use an amalgam that will not discolor in the mouth. In conspicuous positions, of course, this may be well enough; but without doubt a degree of discoloration (some formation of sulphide salts) is favorable to tooth salvation. This dark sulphide of silver and copper is an insoluble salt that has the mechanical effect of preventing leakage, and the therapeutic effects of promoting recalcification of partially diseased dentine. In teeth of young subjects, and where frail walls, and where it is difficult to make retaining points—where a portion of carious dentine should remain undisturbed over a pulp, etc., this strong variety of amalgam that darkens some, and has more silver than tin, and not less than 4 per cent. copper, will do a very lasting and efficient service.

It has been proposed to use gold in combination with amalgam; building the gold upon the amalgam immediately after packing the latter. I believe in such work it is always better to let the amalgam become thoroughly hard before adding the gold; retaining points, etc., may then be made

*This after-mix has baffled seriously some of those who have found that the metals discovered in an alloy analysis did not produce the same results when so compounded in the usual one melt plan. The attempt by the "Keller Medicine Company," of Fort Wayne, Ind., to reproduce any and all brands of alloy will be a miserable failure. In their card, No 10, they say they find in my "Old" 1 per cent. platinum and 8 per cent. zinc!!! and yet not a particle of either is put into it. They find *no copper* and yet it contains *5 per cent. copper*. Such pretensions to analysis is simply outrageous. If even the formula was correctly known (and it's no secret) how could they produce the same if they melted all the metals at simply one fuse?

in the amalgam and tooth walls conjointly. In this way the gold will (as is generally desired) retain a better color, while all the benefit of compounding for the superiority of amalgam in cervical and frail marginal positions is as well secured. In compound cavities in bicusps, and approximal cavities of cuspids and incisors, where the posterior or lingual borders are frail and must be freely cut away, this combination with gold and amalgam offers good and useful results, and makes clean artistic work without losing unnecessarily tooth tissue, or endangering a nearly exposed pulp. It has been observed that where gold has been worked into a fresh amalgam that even the amalgam gets darker than where used alone. This seems so; but if the amalgam is allowed first to harden before the gold is added this tendency is much, if not altogether, obviated.

For saving the deciduous teeth there is nothing in use that nearly equals amalgam; and I feel like urging the profession to consider its claims in this respect. No difference what the age of the child, or to what condition of society belonging, it offers the most good, the least suffering and fatigue to the little patient and also to the operator. How frequently the caries is just approaching the pulp chamber, and the warnings of a restless night brings the case forth. Now to simply remove the caries well from the borders, disinfect (with a little carbolic acid) that overlying the pulp and fill at once with amalgam; (which can be done without the torture of the coffer dam; and even though the saliva may flow over the work while progressing,) a very good protection will result.

Right here permit me to say, in cases where temporary teeth are badly decayed in approximate surfaces, and from the short form of the teeth, and frailty of the walls difficulty attends the securing of a separate filling for each tooth; a very good way is to extend an amalgam filling from cavity to cavity. This joining of the teeth in such cases does admirably, and where they are a little apart, a small bar of silver can be laid with an end resting in each cavity and

upon some already introduced alloy, and thus anchored with amalgam, each aids the other; and the bar has prevented the amalgam from being pressed unduly upon the intervening gums.

In the repair of a rubber or a celluloid plate, where a tooth or a block of teeth is to be restored, strong amalgam does it quickly and very completely. Grind and adjust the block, and directly beneath the pins cut holes and fissures with retaining walls. Fix the block in position by placing the edge of the gum border into a bed of warm gutta-percha, taking care that it does not interfere with the retaining orifices. Now pack the holes, and space about the pins, completely with amalgam, and when hard, dress up. If the amalgam is strong, and the case not put to use too soon, it will do excellent service. It is done quickly and saves the plate from the dangers and damage of reheating.

But this communication is getting too long, and with a word about testing amalgams I close.

Every operator should test his alloy in regard to all the indispensable characteristics.

His experience will soon qualify him to judge as to its suitable rate of crystalization. It may set too rapidly, or too slowly. He can judge pretty well of its quality of strength by testing with file, hammer, etc.

For expansion or contraction he should provide himself with small pieces (say half an inch in length) of glass test tubing (obtained at almost any drug store.) Fill some of these just as carefully as he would a cavity in a tooth. Place them in a solution of red analine; or in his writing ink. If the amalgam will contract, then the leakage will appear and can readily be seen. If it expands the glass tube will crack. In either case the alloy is faulty. For color test, a button of amalgam with a polished surface may be dropped into a solution of sulphuret of pottassa (forty grains to the ounce of water will do) and let remain twenty-four to seventy-two hours.

As before stated the whitest alloys should not be se-

lected where the most strength and durability is needed. An amalgam that will darken but little in the above named solution may in most mouths remain quite slightly, and especially for molars be a very good grade, so far as color is concerned, and the best for durability.

Whatever amalgam is used in the mouth, every step requires and deserves being done well and skillfully. Each filling should be well evened up and polished after it has become thoroughly hard, and the necessary instructions imparted to the patient to keep them in clean and polished condition.—*Dental Luminary*.

ARTICLE V.

DISCOLORATION OF GOLD-FILLINGS.

BY S. B. PALMER, D. D. S., SYRACUSE, N. Y.

I shall detain you but a very few moments. We often see articles in our journals touching upon the subject of the discoloration of gold-fillings, which present some facts and many theories. It is not my purpose to discuss in detail all these theories, but simply such as I believe have not been generally presented. It is desirable that this subject should be better understood and the facts recorded for further reference.

What are the facts? In regard to discolored fillings: First, they vary from copper color to black; second, two fillings from the same gold and in the same mouth, discolor differently; third, sometimes nearly all are black; fourth sometimes they discolor only at the cervical border near the gums.

The most frequent changes occur with one or two fillings in the same mouth. This can readily be accounted

for from the fact of the use of the burnisher upon the gold when the filling has been ground down by corundum sand or pumice, which leaves upon the gold a deposit like diamond dust which cuts the instrument. Where a filling is exposed to the action of the brush this will not remain long. Figures have been given us, but we know there is not enough wearing away from the instrument to account for other known conditions.

Mercury has been set forth as a quite prominent cause of the discoloration of gold fillings, and it would seem true when in close proximity to gold. When we patch gold fillings with amalgam or put gold upon amalgam where there is a distinctly defined line, we seldom see the mercury leave the amalgams and pass over to the gold, but the gold seems stained a brownish color, so we cannot account thus for this general discoloration.

For many years I have been satisfied in my own mind as to the cause, and I have made a series of experiments which will authenticate the position taken, Lead, zinc, mercury, copper and iron will all deposit on gold, but I regard iron to exceed, by far, all the others, both in its frequency of being present and its readiness of attachment by galvanic action.

Experiment 1. An eight-penny nail was placed in a tumbler of water over night when it was removed and number twenty gold foil introduced. This remained in the water for fifteen to twenty hours and on annealing gave a decided copper color. I placed a carpet tack in water over night but without any effect whatever.

Experiment 2. A rope of gold prepared as for filling a tooth was made to receive at one end the point of a carpet tack; the rope was then bent in a loop and the two ends immersed over night in pure water. The gold was thus polarized and the iron transferred to and deposited upon the gold.

Experiment 3. When water containing zinc, tin, copper or iron was used, it coated the surface of pure gold,

either in water, acid, or alkali. An amalgam filling which had been worn in the mouth was drilled into and suspended in water, and connected with small pieces of number twenty gold foil. The color under these circumstances was darker than when iron simply was used, but some was not perceptible until submitted to the influence of sulphuretted water, or sulphuretted hydrogen gas, and this was generally driven off by annealing, except when iron was sufficient in quantity to remain upon the gold.

Iron I consider the most frequent cause of this discoloration. Years ago, before the advent of annealed ware, I first tried the experiments and became convinced that the discoloration was often caused by the use of iron vessels used in cooking. It was my custom whenever I saw a discolored filling, to ask the patient what kind of acid food he or she used, and it was generally cabbage or some other vegetable cooked in an iron vessel. Now this would take off sufficient iron to show the trace upon the filling. Iron is very often used for tanks, and if you take the pains to ask the patient, you will find that iron has frequently been derived from water stored in such tanks or conveyed in iron pipe.

Iron is also frequently given as medicine, tonics for example, and a little inquiry of your patients will show that iron has been taken in that way. Now, do not blame the physician, for iron it would seem must be taken; and then, I am pretty well convinced that this effect is a secondary one, and held in the secretions and like lime deposited upon the teeth. I regard iron, as deposited by the same process, under conditions favorable to cohesive attraction.

There is one principal in nature, which if we understand, will clear up this whole subject, and that is electrical induction or polarity; for example, the atmosphere is positive, and the surface of the earth is negative. If we attach an iron rod to the earth the upper end is negative and the lower end positive, and this principal is as true in the cavity of a tooth as it is in the atmosphere; every metal filling

passing from the crown of a tooth to the cervical border is polarized when the mouth is opened for breathing or changes of temperature. When exposed, the portion covered by food or moisture is positive. Do not understand me as saying one end of the gold filling is positive and the other negative; but one end is covered by food or other substances, and by decomposition at the cervical edges becomes polarized, and this coming in contact, an acid is the result; and it readily deposits by galvanic action upon the surface where this takes place, whatever metals may be in the mouth where this decomposition is going on. There are all the means of decomposition present by this process. This occurs in fillings composed of one metal and in fillings of tin covered with gold. The tin becomes positive and the gold negative, and it thus forms an oxide or sulphide of silver, and this is received into the porous or softened dentine, which greatly retards decomposition of tissue.

Dr. W. D. Miller, of Berlin, does not agree with me upon the subject of polarity, but did agree in a paper presented by him last year, that the amalgams hinder decomposition better than gold. The amalgam in contact with gold is acted upon in a greater degree, and by this increased action is rendered negative, much more than if the gold is not present, and destroys low forms of life without question. The application I make is that by reason of decomposition, the gold is very apt to receive any metal held in solution, the gold being the negative element.

To my mind there is no more mystery in the discoloration of gold than in the deposition of one metal upon another by the electro-galvanic process being the same in the one case as in the other.—(*Dontographic Journal*).

ARTICLE VI.

TREATMENT OF DEEP-SEATED ABSCESES
WITHOUT EXTERNAL INCISION.

BY JOHN S. MARSHALL, M. D., CHICAGO, ILL.

[Read before the Minnesota Dental Society, August 1, 1885.]

By deep-seated abscesses I mean those cases of alveolar abscess which have extended beyond the ordinary limits, and have involved more or less extensively the structures of the jaw, with a tendency to necrosis, or have penetrated the antrum of Highmore or escaped from the neighborhood of the maxilla, and have burrowed downwards between the muscles of the neck, as frequently occurs in abscesses associated with the inferior teeth.

Ordinarily the diagnosis of these cases is not difficult, but occasionally the cause has proved troublesome to find. Abscesses discharging into the antrum, or the nasal fossa, and producing offensive discharges, have been diagnosed as chronic catarrh. One case occurring in the practice of Dr. Edward Maynard, of Washington, D. C., caused by an unerupted inferior wisdom tooth, and discharging into the larynx, setting up an irritative cough with expectoration of pus and mucus, was previously diagnosed by the physicians to be acute bronchitis; others discharging at some point upon the side of the neck have been set down as abscesses originating in the cervical glands, the result of scrofula.

That such abscesses often prove to be serious affections, endangering the health, add sometimes even the life, of the individual, are well established facts.

I purpose, however, in this short paper to confine my remarks to the more common, and, from their location, the more dangerous class of these cases, viz., those originating from disease of the inferior teeth.

The tendency of the suppurative products in these cases is downwards through the external wall of the alveolar process, and to point at the lower margin of the jaw; but it also happens—especially with the molars—that instead of pointing at this location it opens through the internal wall of the alveolar process, and burrows downwards between the muscles of the neck, and may discharge into the throat, or through the external tissues at various points from the sub-maxillary triangle to the superior border of the clavicle. Any suggestions, therefore, in regard to the treatment of these cases which will tend to cut short the suppurative process, lessen the dangers to health and life, avoid the necessity of operating with the scalpel in a location requiring such delicate dissections and fraught with so much risk to the patient, or to prevent the unsightly and oftentimes disgusting scars which follow the external opening of these abscesses, will I think be of interest. The treatment frequently adopted in cases of alveolar abscess is the removal of the cause by the extraction of the offending tooth, trusting to nature to complete the cure.

In extreme cases of this deep-seated variety an incision is made through the external tissues at the lowest point of the abscess, for the purpose of drainage. In those cases, however, where the pus has burrowed deeply into the tissues of the neck it is quite likely that more than one pocket will be formed; consequently the treatment by incision becomes complicated, and sometimes, from the dangers of an extended operation in the superior or inferior carotid triangles, would be precluded altogether.

The surgeon, under such circumstances, has had no alternative but to wait, trusting that the abscess would find an opening for itself at less risk, before the patient should die of pyæmia. The treatment which is suggested comes to our relief in this emergency, and from past experience I am prepared to say, at least, that the duration of these cases can be materially shortened, and many of them speedily cured, without resort to any other operative procedure than

the extraction of the diseased tooth and the injection of peroxide of hydrogen into the sac.

Ophthalmologists and aurists have found this agent very useful in the treatment of diseases of the eye and ear, with purulent and muco-purulent discharges, and dentists have been signally successful with it in the treatment of pulp chambers with putrid contents, in ordinary alveolar abscesses and in pyorrhea alveolaris. By injecting an abscess of the deep-seated variety with peroxide of hydrogen, introduced through the alveolus of the extracted tooth, the purulent contents can be thoroughly evacuated.

The oxygen is set free on coming in contact with the products of decomposition, which distends the cavity and forces out the pus through the alveolus by mechanical pressure. Two or three injections of from a half a drachm to an ounce, according to the extent of the abscess, may be required to completely remove the purulent matter, and if given opportunity it will search out and purify every hidden receptacle. I have had several opportunities since its introduction to the notice of the dental profession, by Dr. Walter Coffin, of England, at the London International Medical Congress in 1881,* to test its efficiency in this class of cases, and in extensive periosteal inflammations of the jaw.

In one case, a Mercy Hospital patient, Mary N. Irish, aged twenty-four years, was suffering from a deep-seated abscess associated with the right inferior wisdom tooth for several weeks. The patient was confined to her bed for twenty-six days, with pulse ranging from 100 to 116, and temperature from 101° to 104.8° . She was speedily relieved by extracting the tooth and evacuating the pus. The abscess extended down the neck four and a half inches below the margin of the gums, as was ascertained by the probe. The pulse dropped from 104 to 96 and the temperature from 104.8° to 103° within two hours after the operation. A half ounce of the peroxide was ordered to be injected into the

*Transactions of the Seventh International Medical Congress.

abscess every four hours. This was followed by a decrease in the temperature of one degree each day for three days. The patient then refused to submit to the further use of the remedy at that time, as the evolution of the gas, by distending the sac, caused pain. An increase in the pulse rate and an elevation in the temperature immediately followed. On the fourth day afterwards the pulse was 101 and the temperature 104°.

The peroxide was again used as before, and the pulse and temperature again rapidly fell, but through the obstinacy of the patient the treatment could not be carried out with any degree of satisfaction; still the fact was established that the remedy antiseptized the pus and evacuated the sac, as indicated by the rapid improvement in the symptoms.

Another case was that of a little girl, aged eleven years with an abscess originating from the right inferior first molar and extending into the tissues of the neck, accompanied with extensive swelling and tenderness, but with no acute pain. The swelling of the parts had followed an attack of severe pain in the tooth and jaw, from which she had suffered three weeks previously. For a week the jaws had been closed, and the only food taken each day was a little milk. The child had been confined to bed for a part of the time, and when presented for treatment looked decidedly ill. The tooth was extracted under ether, and the pus cavity found to extend downwards three inches below the margin of the gum. Very little purulent matter followed the extraction of the tooth, but on injection the pocket with peroxide large quantities were evacuated. The injections were continued once daily for six days, when the patient was pronounced cured, all discharge having ceased, and the swelling nearly disappeared. Under the ordinary treatment I should have expected to have seen the trouble continue for a much longer period, and perhaps to have seen the abscess point low down on the neck.

One other case was that of a lad nine years of age, who had received an injury of the inferior jaw by a fall from

his bicycle, resulting in an extensive acute periostitis, involving the teeth and jaw from the second temporary molar of the left side to the ramus of the jaw on the right side. All of the teeth between these points were loose; pus exuded from the gums at the necks of the teeth, and I feared extensive necrosis. The treatment adopted was injections of peroxide beneath the gums at all points where pus was found to exude. The condition at the anterior part of the mouth began to improve at once, but opposite the first permanent molar at the lower margin of the jaw it was necessary a few days later to open an abscess which was about to point there. The injections were kept up for two weeks; all discharge had then ceased, and the teeth had become firm.

Dr. Harlan has recently called attention to the use of this agent in purulent conditions effecting the maxillary sinus,* and I would suggest that it will be found equally valuable in the hands of the surgeon in nearly every variety of suppurative inflammation, especially in periostitis, necrosis, and deep-seated abscesses, where there is difficulty in completely evacuating the purulent matter by the ordinary means.—*Dental Cosmos*.

*Archives of Dentistry, page 204, May, 1885.

MARYLAND STATE DENTAL ASSOCIATION.

The 3rd Annual Meeting of the Maryland State Dental Association, will be held in Baltimore, January 8th, 1885. S. W. corner Charles and Lexington Sts, at 8 o'clock, P. M.

WM. A. MILLS, *Cor. Sec'y*.

Editorial, Etc.

THE SECTION OF ORAL AND DENTAL SURGERY IN THE INTERNATIONAL MEDICAL CONGRESS.*—*Report of a Special Conference of Dentists held at the Genesee House, in the city of Buffalo, Nov. 16, 1885.*

For the purpose of determining the feeling of representative dentists from all sections of the United States, concerning the Dental Section of the Congress of 1887, the following circular, prepared by Prof. Taft, was mailed to about fifty dentists.

SPECIAL CALL.

DEAR SIR—You are no doubt aware of the fact that the difficulties that some time ago interrupted and embarrassed the organization of the Ninth International Medical Congress have been in the main removed, and it is now proposed to complete the organization.

A meeting of the Executive Committee, for this purpose, will be held in New York, on Wednesday, the 18th inst.

That committee consists of the President of the Congress, the Secretary General, the Treasurer, the Chairman of the Finance Committee, and the Presidents of the Sections.

The following subjects will be presented for the consideration and action of the committee, viz.:

*We omit the "Editorial" for the purpose of presenting to the readers of the JOURNAL the proceedings of the recent meeting held in Buffalo, N. Y., to obtain the opinion of a number of the leading dental practitioners on the advisability of organizing the Section of Oral and Dental Surgery in the International Medical Congress. This report is from the December No. of the *Independent Practitioner*. The Editor of the JOURNAL was unable to be present in response to a notice from Prof. Taft, but he cordially endorses the action of the gentlemen who met for consultation.

1. Organization of the Executive Committee.
2. Unfinished business, list of vacancies, etc.
3. Reports of Sub-Committees—Finance, Circulars, Correspondence, etc.
4. Special business. Recognition of the Congress by the United States and foreign governments. Design for a seal, a medal, etc. Public announcement of the organization of the Congress.
5. New business. Appointments of Sub-Committees to report to the Executive Committee at St. Louis. (1) On organizations of Sections and duties of officers of the Congress. (2) On nominations of foreign officers and on vacancies. (3) On foreign papers and discussions.
6. Nominations to fill existing vacancies.
7. Election. Adjournment to-day fixed.

The Section of "Oral and Dental Surgery" has been restored to the position assigned it by the original committee.

If the work contemplated in the establishment of this Section is to be done in a manner to obtain the highest results, it is indispensable that it should have the hearty approval and co-operation of the dental profession. In view of this fact, and in order that the opinions of at least some of the more prominent members should be ascertained before the meeting of the Executive Committee in New York, it is proposed to request twenty-five or thirty of the persons most interested in this matter to meet at the Genesee House in Buffalo, N. Y., on Monday the 16th inst., at 10 o'clock A. M., for consultation, suggestions, and a full understanding of the questions involved.

It is earnestly desired and very important that you be present at this meeting, and give such counsel as in your judgment will be for the best interest of our profession.

Yours respectfully,
J. TAFT,
W. C. BARRETT.
W. W. ALLPORT,
A. M. DUDLEY.

In compliance with this call, the following named dentists assembled at the time and place designated:

J. Taft, Cincinnati, O.

A. M. Dudley, Salem, Mass.
Geo. L. Fields, Detroit, Mich.
C. R. Butler, Cleveland, O.
W. P. Horton, Cleveland, O.
A. O. Hunt, Iowa City, Iowa.
L. D. Shepard, Boston, Mass.
J. B. Coolidge, Boston, Mass.
W. N. Morrison, St. Louis, Mo.
W. C. Barrett, Buffalo, N. Y.
C. N. Pierce, Philadelphia, Pa.
W. W. Allport, Chicago, Ill.
J. N. Crouse, Chicago, Ill.
A. W. Harlan, Chicago, Ill.
T. W. Brophy, Chicago, Ill.
C. R. E. Koch, Chicago, Ill.
W. F. Fundenberg, Pittsburgh, Pa.
W. H. Atkinson, New York, N. Y.
G. C. Daboll, Buffalo, N. Y.

Letters of regret were received from a number of others, who had been invited.

The meeting was called to order by Dr. Taft, and on motion he was elected chairman, and Dr. Dudley was elected secretary.

Dr. Taft stated the object of the meeting, which was a full consultation and conference as to the action advisable in view of the re-establishment of the Dental Section in the coming International Medical Congress. He gave the present status, and adverted to the coming meeting of the executive committee of the Congress, in New York, Nov. 18th.

Dr. Crouse—Said that the first thing to be determined by this conference was the desirability of the establishment of a Section of Dental and Oral Surgery.

Dr. Shepard—Enquired why the Section was dropped after once being established?

Dr. Taft—Replied that the only reason that had been given was, that there were too many Sections, and there was not room for them to work.

Dr. Allport—Gave a history of the original establishment of the Section, and of his own action in connection with it.

Dr. Barrett—Said that those who were in attendance upon the Congress of 1881, in London, had ever since rested under a weight of social and scientific obligation; that they longed for nothing so much as the opportunity to repay it. They hail with delight the announcement that the Congress of 1887 would be held in this country. When it was announced, they were astounded with the information that no Dental Section was provided for. This, in the country where dentistry had made greatest progress, was to them incomprehensible. If the English physicians had invited us in, was it for America to exclude us? But soon we were informed that a Section had been established, and a list of officers was submitted. We were content, and began to brace ourselves for the effort of making our Section a yet greater success than that of its predecessor in London. Then came the revolutionary proceedings in the American Medical Association at New Orleans. A single society arrogated to itself the entire direction of the Congress, and proceeded to exclude all who were not in affiliation with it. The old committee was ousted, and our Section was dropped under humiliating circumstances. But the new committee soon found that they had alienated many of the representative men in medicine, and they were met by that which they could but have anticipated. A large number of the officers of the Congress resigned, and declined to have anything further to do with it, and this action was followed by the withdrawal of a considerable portion of the profession from any participation in the organization. A palpable failure stared them in the face, but they were determined to persevere. They saw that the aid of the dentists in this, their extremity, was desirable, and the Section was re-established. But they were now engaged in a heated quarrel, and it seemed demonstrated that the Congress was doomed to a scientific failure. There was no probability that any foreigners of note would attend, and it would lack the character of internationality.

We had been severely snubbed. The secretary had stated that "the omission of the Section of Dental and Oral Surgery was judicious, dentistry not being generally recognized as a legitimate department of medicine." It was only when failure was imminent that they turned to dentistry, and again invited

it to come in, and this was done, it had been said, "in response to numerous and urgent requests for its re-instatement, on the part of the dentists." It would be interesting to know who were the dentists who had thus begged to be taken back. Under the present circumstances, unless the original status was resumed, and the original committee reinstated, we could not, unless at the sacrifice of self-respect, again take part. If we were so forgetful of our dignity as to return and attempt what must result in failure, we should remember that we stand, in a certain sense, the representatives of the dentists of the world, and we owe something to them. We have no right to compromise European dentistry by attempting to call such a section "International," when we are fully assured that but a portion of the profession of America, alone, will take part in it. He offered the following resolution:

Resolved, That we as members of the dental profession, deem it inexpedient to recommend the organization of a Section of Dental and Oral Surgery in the International Medical Congress of 1887, under the present circumstances.

Dr. Shepard—Desired to put apart any consideration of a personal nature. The question is, whether under the present circumstances it is advisable to establish a Dental Section. Will foreign dentists be likely to attend it? He thought not. From New England there is not a single man of acknowledged representative character who will be connected with the Congress. He believes that it will not be of an international character.

Dr. Allport—Thought that the differences would soon be healed, and the Congress prove a success.

Dr. Butler—Thought it was not to our interests to enter the Congress, under the present circumstances.

Dr. Koch—Desired to follow a different line of argument, in opposition to a Dental Section. He thinks that we are taken on sufferance, and for the possible help that we may be able to furnish. We are not invited with that cordiality that warrants our engaging in the Congress. He would prefer to reserve our forces for a possible International Dental Congress.

Dr. Daboll—At the meeting of 1881 felt that he but

waited the opportunity to contribute something toward the social and scientific entertainment of those to whom he was under a weight of obligation. The Congress of 1887 did not promise such a success as would give him that occasion, and therefore, he was not in favor of a Dental Section.

Dr. Hunt—Thought the resolution did not go far enough. It would be well for us to express the reasons for our action, lest the declarations might be prejudicial to our hopes of such a Section becoming a fixture in future meetings of the congress.

Dr. Harlan—Had a letter from Magitot, in which he stated it as improbable that he should attend, and he thought it extremely unlikely that there would be any foreigners of note present. The dentists formed about one-sixth of those engaged in the healing art, in the United States. Surely something was due them, but it should come in such a way that we could accept it without a loss of dignity. He deemed it inadvisable to enter the Congress of 1887.

Dr. Brophy—Had watched the proceedings of the Committee of the Congress with interest, and he believed that unless radical changes were made the meeting could not be a scientific success. It is not possible for our Section to prove a credit to us unless the whole meeting shall be a success, and this was, to say the least, extremely problematical. The dental section of the American Medical Association, that commenced under happy auspices, has dwindled down to almost nothing.

Dr. Horton—Does not believe that the best men among the dentists will be willing to be active in the formation of a dental section of the Congress, as it is at present organized.

Dr. Fundenberg—Is opposed to the formation of a dental section, for the reasons already stated.

Dr. Morrison—Thinks that if we take the course indicated by former speakers, it would indicate that we feared the results. There is a higher position that we might assume. We should keep up the Section for the sake of the future. If we definitely refuse now to take part, as the resolution contemplates, and the Congress should prove a success, we might regret it.

Dr. Atkinson—Said that the resolution contemplates no such definite and final refusal. It was only under the present

circumstances that we deprecated or declined action. If the organization of the Congress was changed, and those in whom the medical profession placed confidence assumed the direction, we could then act heartily in accord with them.

Dr. Field—Fully concurs with the general tone of the remarks made here. We have been dropoed from the Congress under humiliating circumstances, and he is now in favor of staying out. The most dignified course that we can take is to quietly step one side, and watch the progress of the medical fight, ourselves taking no part.

Dr. Pierce—Has consulted with prominent medical men of Philadelphia. Dr. Hays has received a letter from Sir James Paget, President of the Congress of 1881, and he is in a position to speak for the medical profession of England and Germany, and is positive that no representative men from those countries will attend the Congress of 1887. He believes that we cannot, consistently with self-respect take any part in the coming Congress.

Dr. Crouse—Likes to be on the other side, and to act with the minority, but here he finds himself unable to do so. He does not think that, under the present management, the Congress can prove a success, and believes that we are better out of it.

Dr. Allport—Wished to remove any impression that we should be humiliated by entering the Congress. We should here express no opinion, but leave the whole to Dr. Taft, who is a member, *ex-officio*, of the Executive Committee, and when he reaches New York he should be allowed to use his own judgment, and if he thinks a Dental Section should be established he should act in conformity with that belief.

Dr. Shepard—Said that Dr. Taft had called us together, some of the members of the conference traveling nearly two thousand miles, for the purpose of obtaining our opinion and offering our advice. If no expression of judgment was given the conference was a farce.

Dr. Coolidge—Had little knowledge of the subject, and therefore hesitated to express a positive opinion.

The Secretary read letters from Drs. Frank Abbott, J. L. Williams, of Boston, Geo. H. Cushing, Thos. Fillebrown, B. H.

Catching, H. J. McKellops, S. B. Brown, Ed. Maynard, W. H. Morgan, W. H. Trueman, C. A. Brackett, E. T. Darby, A. H. Thompson, M. W. Foster and others, the general tone being adverse to the formation of a Section of Dental and Oral Surgery.

Dr. Dudley—Said that he was at first anxious for the establishment of such a Section, but when the revolutionary proceedings were adopted at New Orleans, he became convinced that the Congress must result in a scientific failure. If we now took any part in the Congress we shall be connected with the factional fight, and be identified with one of the parties. We cannot with dignity go back when we have once been turned out.

• There was considerable desultory discussion regarding the status of such as should be admitted to the Section, if established, and the qualifications necessary for admission.

Dr. Taft—Said that a part of the Council of the Section possessed only the D. D. S., and it was not at all probable that any one having that degree, even though he was not a graduate in medicine, would be excluded,

A number of verbal amendments to the resolution were offered, it clearly being the opinion of those present that, under happier auspices, the dentists would heartily co-operate, but all were voted down, as it was urged that the resolution provided for such a contingency.

Finally, the resolution being put to vote, it was adopted unanimously, and, upon motion, the conference adjourned.

CORRECTION.—We have inadvertently published in the Sept. No. of this JOURNAL two selections which were credited to the *Items of Interest* but which, we are informed by Dr. Spalding, Editor of the *Archives of Dentistry* should have been credited to the latter Journal. We gladly make this correction as we were not aware of the claims of the *Archives of Dentistry* until so informed by its Editor, nothing appearing in the *Items of Interest* to indicate the ownership of the selections in question.

Obituary.

DR. JOHN P. HOLMES.—It is with great regret that we note the death of one, who for many years has been prominently and most favorable known to the dental profession of the South as a gentleman of the highest character and of sterling integrity. Dr. Holmes was born at Spring Ridge, Hinds county, Mississippi, July 18th, 1842.

He died of apoplexy, at his residence in Vineville—suburban village to Macon, Ga., September 2d, 1885, in the forty-third year of his age. He was the son of Mrs. R. L. and Dr. Henry J. Holmes; the latter a prominent physician in Mississippi, who died in 1875.

Dr. Holmes graduated at the Ohio College of Dental Surgery in the class of 1868, and since 1878 has been connected with his brother, Dr. W. R. Holmes, in the dental depot business in Macon, Ga. This firm publishes the periodical entitled *Dental Luminary*, many of the articles which have appeared in its columns being from the pen of Dr. John P. Holmes. The dental profession of Georgia, and also adjoining States will sadly miss Dr. J. P. Holmes, as he manifested great interest in all that related to dentistry, and was one of the most prominent members of his State Dental Society.

DR. JOHN M. RIGGS.—Died at Hartford, Conn., Nov. 11th, 1885, of typhoid pneumonia in the seventy-sixth year of his age. Dr. Riggs was one of the old-school practitioners of dentistry, having commenced practice in 1840 in Hartford, where he continued to reside to the date of his death. Two years before the anæsthetic use of ether, in the year 1844, Dr. Riggs extracted a tooth for Dr. Horace Wells, while the patient was under the influence of nitrous oxide gas. Dr.

Riggs never married, but was a greatly esteemed citizen, and a leading practitioner of dentistry, gaining considerable reputation for a heroic method of treating alveolar pyorrhœa, this affection being commonly called "Riggs' Disease." Dr. Riggs was one of the vice-presidents of the Southern Dental Association at the time of his death, having been elected to that position at the New Orleans meeting of 1885.

Monthly Summary.

SORE MOUTH UNDER PLATES.—Dr. G. V. Black says: "The subject of sore mouths found under rubber plates should be further investigated. This condition has been attributed to the coloring matter of red rubber plates, but it appears under metal and porcelain plates also. A partial study of the causes of this disease has led to the discovery of leucocytes and micro-organisms under plates. In examining scrapings from plates and gums I have been surprised at the abundance of these organisms. If more abundant under rubber than under metal or porcelain plates, I am disposed to attribute the fact to the rougher surfaces of the rubber plates, which afforded greater facilities for the lodgment of foreign substances of a nature favorable to the growth of the organisms. Wandering cells—leucocytes—were seen constantly changing forms, micrococci aggregating around and among them. The wandering cells take up and digest the micrococci and thus aid in preventing the increase of the latter. Cleanliness is the chief preventive. The condition described differs from that of mercurial poisoning. I do not regard the coloring matter injurious. The temperature of the tissues under a plate of non-conducting material varies from the normal less than one degree. Plates are not cleansed frequently enough.—*Items of Interest.*

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ARTICLE I.

DISEASES OF THE PERIOD OF DENTITION.

BY W. C. BARRETT, M. D., D. D. S.

(Delivered before the American Academy of Dental Science, at its 18th Annual Meeting, held in Boston, November 4th, 1885.)

Men naturally look to the east, to the place of the rising of the sun, for light. Shall you who live in the sun's eye look to the west, to the direction of the shadows, for illumination? Shall I, who all my life have been standing on tiptoe, with my face toward the east that it might catch the first beams of the coming day as they stream over the hill-tops, shall I attempt to give you enlightenment? We recognize the eastern cities, Boston, and New York, and Philadelphia, as the great centres of professional intelligence. It is to them we look when we would estimate and gauge the rate of advancement. We, of the inland cities and towns, are content to measure our pace by yours, and to keep step with you in the onward professional march, so far as our abilities permit. And will you stretch forth your

hands to us for aid? Will you humble yourselves so far as to sit at our feet and endeavor to learn of us? Such seems to be your will, and I answer your call, stipulating only for the forbearance which you will necessarily be called upon to exhibit.

Wordsworth truly said—"The child is father to the man,"—and the aphorism is pregnant with a great truth, for it is upon the impressible nature of childhood that the great influences are at work which shall mould, and shape and determine the character of the young man. We all know how potent are the associations and influences of childhood, and how impossible it is for us, in after years, to divest ourselves of the impressions that may then have been stamped upon us. The habits and customs, the faiths, the beliefs, the superstitions which we may have acquired in manhood, may be laid aside like a worn garment. But the rules, the tenets, the habitudes, the prejudices, the very methods of thought which we acquire in childhood, hold dominion over us till the final end shall come.

It is emphatically true, then, that in the mental world the child is father to the man. Nor is it less the fact in the physical domain. As the twig is bent the tree is inclined. As this body of ours, composed of so many separate organs, is trained in infancy and in youth, so will it grow up to manhood. Vicious habits of life, early acquired, will cling to us in old age. That intricate piece of machinery, the digestive apparatus, may easily be put out of repair in infancy. Once fairly regulated and set in methodical motion it is proof against the results of misuse. The delicate nervous organization, by irregular habits in youth, may become like sweet bells jangled, out of tune and harsh. But the period of youth once passed in perfect health, all the subsequent unnatural drafts of our busy lives will be duly honored. Few can realize this better than myself. It was my good fortune to be raised in the country, to be reared upon country regimen and to be obliged to conform to country habits of regularity in eating and sleeping. These

early years so richly endowed me with a perfect nervous organization that all the excesses of my mature years, all the over-work, the irregularities of diet, the occasional extreme taxation of my physical powers, are cured by a good night's slumber.

Old Adam, in Shakespeare's "As You Like It," says :

"Though I look old, yet I am strong and lusty ;
For in my youth I never did apply
Hot and rebellious liquors in my blood ;
Nor did not with unbashful forehead woo
The means of weakness and debility ;
Therefore my age is as a lusty winter,
Frosty but kindly."

It is the irregularities of youth, and not the excesses of maturity, that strew the highways of life with so many wrecks of manhood.

If then, the human race is to be improved, if particular organs are to be rescued from the results of inheritance or of predisposition to disease, the work should be begun with existence, and hygienic measures must be adopted in early life. The teeth of the human race are the organs which soonest fail, while there are few upon which the comfort of the age is more dependent. I could not, then, offer for your consideration at this time a subject of greater importance than that of the teeth during childhood. I shall not consider it from an anatomical or a histological stand-point, but shall confine myself to a physiological consideration of the matter.

The eruption of the deciduous teeth is not of itself a process that should be attended with any very serious disturbances. It is as purely physiological as is the growth of the hair or the nails, to which the teeth, as epidermoid structures, are allied, yet the period of dentition is almost universally recognized as the most perilous of our whole existence. That the dangers and the disturbances which are too frequently the accompaniments are due to the mere eruption of the teeth, I cannot believe. I am rather of the opinion that most of the febrile disturbances and the gastric

irritations of the period of first dentition are coincidental, and due to other causes, and it is the object of this paper to examine some of these phenomena, and to trace them to their real cause.

The digestive apparatus undergoes great changes during existence. Not only is the histological structure of the organs different in the infant from those of the adult, but their functional action undergoes important changes. The character of the secretions is markedly different at different ages. Previous to birth, while the foetus is deriving its nourishment from the blood of the mother through the placenta, the digestive apparatus is mainly dormant, and the different glands, which as yet have not been called into active exercise, provide no digestive and but little of other fluids. The lungs, too, are not as yet exercising their function, and the mother breathes, as she also provides nutriment, for both. But immediately upon the severance of the umbilical cord, or the stoppage of the placental circulation, the first stupendous change of conscious existence takes place.* The blood, no longer purified through the lungs of the mother, must have its separate and individual process for oxygenation, and this change, unlike the previous and subsequent modifications of growth, must be instant, and not gradual.

The circulation of the human embryo has already undergone one change *in utero*. Previous to the formation of the placenta, when the umbilical vesicle was the sole source of nutrition, there was a complete round of the cir-

*It should be remembered that the first attempt at breathing is involuntary, and succeeds the stoppage of the supply of oxygen from other sources. If a pregnant animal be thoroughly anæsthetized, the uterus opened and the foetus, it matters little at what period of existence, exposed to the air, there is no attempt at breathing so long as the placental circulation is kept up. But shortly after the severing of the umbilicus the tissues begin to feel the need of oxygen, and there are spasmodic attempts at breathing. If the foetus be not sufficiently advanced for this it dies of suffocation. But if it can breathe, separate existence at once commences, by the establishment of the pulmonary circulation.

culatory fluid in the embryo tissues, and that circulation, like that of extra-uterine life, was wholly within itself. The vitellus was the organ which provided the foetus with nourishment, and the vitelline circulation was that which carried pabulum to the formative tissues. But with the formation of the allantois the umbilical arteries came into existence. As the umbilical vesicle diminished, the allantois enlarged and was changed into a vascular chorion, and a part of this became the placenta which, during the greater part of intra-uterine life, supplied the growing foetus and carried on its circulation.

These changes were gradual, but at the period of birth commences another circulation. The blood is now almost instantaneously directed to the lungs, which by the first feeble cries of the newly-born child are inflated with air, and so commences adult circulation. The ductus arteriosus, which, during foetal life, had conveyed the blood directly from the right ventricle to the aorta, without its entering the pulmonary artery and the consequent pulmonary circulation now closes up, while the pulmonary artery enlarges, and the blood is forced by the right ventricle through it, and thus independent oxygenation commences by the entrance of the lungs upon the active performance of the function of respiration.

All through these successive changes alterations are going on in the digestive organs. During foetal life the alimentary canal has become partially filled with an accumulation which has received the name of meconium. The gastric juice is not yet secreted, although the liver provides a very scanty secretion. But at birth the digestive organs are called into active exercise, and provide secretions that are capable of acting only upon the very simple food which must at first be the sole regimen of the newly-born child. The saliva is not as yet provided with the ptyaline which, later in life, gives it its distinctive character, nor are the gastric or intestinal juices yet of a nature that permits them to act upon any kind of solid food, Nature has provided

the proper pabulum in the milk of the mother, which at first contains the colostrum that shall lead to the expulsion of the meconium which the intestines contain. With the development of the child the milk of the mother undergoes changes which gradually lead up to a stronger diet.

The transitions in the development of the digestive tract extend to full adult life. They are gradual, but they may be divided into successive and well marked stages. The development of the teeth keeps pace with them, and may, in all normal conditions, serve as an unfailing index of the state of advancement of the internal organs. At first there are no teeth, for the condition of the digestive tract is such that it cannot prepare for assimilation any form of solid food. The pabulum must be of the simple, mild character of the milk of the mother, which contains in solution all the nutrient forces needed by the immature organism, and in the exact proportion that nature demands. The substitution of this natural food by any form of artificial food is always more or less disastrous in its results. Nor can an infant of but a few days of age be safely given the milk of a woman whose confinement took place some time previous to the birth of the child. The milk of such a woman is too highly organized for its immature function. When young calves or lambs are deprived of the milk of the mother, and fed on that of others, who have been in lactation for some time, they do not thrive well. This is even more marked in the human race, because the period of lactation should be longer, and the changes are more gradual.

With the growth of the infant there is a progressive development of the teeth, the incisors appearing first. Too many mothers consider this the period at which the giving of solid food may commence. A greater mistake could not be made. For obvious reasons the teeth are successive in making their appearance, and the fact that the small deciduous molars, which alone are effective in mastication, do not appear until some months after the cutting of the incisors,

should teach every mother that it is not until all the deciduous teeth are in position that the diet of the child may with any degree of safety be changed. Up to this time its exclusive food should be the milk of the mother. But with the appearance of the molar teeth the alteration in the digestive function becomes more marked.

It is about at this period that the character of the saliva undergoes a change. The great parotid gland now begins to pour through the duct of Steno, which is directly opposite the molar teeth, a fluid that has distinct parotid qualities. Did time allow, I should be glad to enlarge upon the peculiar properties of this parotid fluid, as distinguished from that of the other salivary glands. It must suffice to say that it is peculiarly fitted to so change the character of some foods as to be essential in their proper preparation for the digestive fluids, and that it is poured out in great quantities during the process of mastication in the precise place, where, if the molar teeth be present, it may be thoroughly mixed with the bolus, previous to deglutition.

The full development of the deciduous molar teeth, then, marks an important era in the growth of the digestive organs, and is an indication that they are sufficiently advanced to receive a diet of greater consistency. Succulent vegetables may now be digested, but the character and size of the teeth show that they are intended only for light use, and that they, as well as the stomach and intestines, are not as yet fitted for the more highly organized animal foods.

With the continued growth of the general system of the child, the digestive tract progresses in efficiency, and the time approaches when it is prepared to assimilate pabulum of a yet more advanced character, and nature with careful hand is preparing the organs for the proper preparations of this food. Another and a larger molar makes its appearance—the largest tooth with which it is to be provided—and now for the first time the dental organs, and coincident with this the digestive organs, are sufficiently advanced to receive animal food of a simple char-

acter, and the more dense of the vegetable pabulums. As growth continues, the diminutive and feeble deciduous teeth are replaced by larger and stronger ones, until, when the age of about twelve years has been reached, the dental structure is complete, and the alimentary canal has reached a period of development that fits it for the digestion and proper preparation for assimilation of any food that is fit for alimentation.

The development of the whole body, if we except certain special organs, has thus advanced by regular gradations. Not entirely by imperceptible growth, for, as in inanimate nature, there are periods of pushing energy, and others of comparative rest. It is by alternation of rest and effort that all organic changes occur. But the general advance of the system is along the same line, and in studying the development of any one organ, or set of organs, it is necessary to consider their relation to the growth of other organs. "To regard the eruption of the teeth as the sole factor in the general process known as the first dentition, is to perpetrate a kind of medical synecdoche. Children get their first teeth because they are at the same time getting a second stomach and second intestines."*

It may thus be seen that the condition and growth of the internal organs of digestion may be accurately gauged, and their capabilities for work exactly determined, by the state of dental development. If, previous to the appearance of the teeth fitted for its perfect mastication, any special food be given the child, it cannot be digested, but must act as an irritant, provoking all kinds of gastric and febrile disturbances, thus not only delaying the progressive development of the alimentary organs, but actually causing their deterioration and the destruction of their functional powers.

To my apprehension it is from the lack of the knowledge of this developmental progression, or from willful

*Pediatric Aphorisma. Prof. Letamendi. *Independent Practitioner*, October, 1884, page 591.

disregard of the lessons which it so plainly teaches, that the most of the so-called diseases incident to teething arise. As I have said, the growth and eruption of the teeth is a physiological process. If they be accompanied by any pathological conditions, these are due to extraneous and ordinarily preventable causes. It is to errors of diet that they should usually be ascribed, and not to the mere advancement of normal organs. An excellent authority says: "While not denying that certain minor evils may attend the evolution of the teeth, it is doubtful if many of the more serious ailments, often accompanying this process, have any dual connection with it."†

Another writer upon the same subject says: "Dentition is usually held to be the cause of many ailments, but to what extent it is really so is doubtful. The time of dentition is one of transition. A uniform and bland diet is changing for one of greater variety, and the febrile attacks, diarrhoea and vomiting, which are so rife at this time, are more satisfactorily explained by indigestibility of food than by some occult influence of tooth-cutting."‡

Dr. Edward Henoch, of Berlin, says: "In the opinion of a majority of physicians teething is a physiological process, that cannot give rise to any morbid phenomena."§

Another competent authority says: "No doubt during the cutting of the teeth, the bowels generally are in a state of irritability, for we know that at these periods the follicular apparatus of the intestines is undergoing considerable development."*

The so-called diseases incident to teething are mainly gastric disturbances. The period of greatest fatality corresponds very nearly with the time of the eruption of the teeth, because it is about this time that most mothers commence a change of diet for the child. With the appearance

†Archives of Pediatrics; June, 1885, page 380.

‡Goodhart. Disease of Children. Page 28.

§Edwards. Therapeutics of Diseases of Children. Page 105.

*Lustace Smith. Wasting Diseases of Infants and Children, Page 67.

of the incisors solid food is given. The infant, with the instincts of nature, rejects it, but the mother persists until a taste for unfit food is acquired, very much as an appetite for tobacco is perhaps obtained in later years. At first, the amount ingested is insufficient to produce serious consequences, and as larger amounts are taken a diarrhœa of no alarming kind manifests itself. The appetite for unfit solid food increases with its gratification, and soon febrile symptoms supervene. The child becomes exceedingly restless. The milk which it takes is regurgitated—perhaps there is vomiting of some curdled milk—the diarrhœa increases, and the discharges have an excoriating effect, until finally digestion stops and the child dies of inanition, or perhaps convulsions, ensue, one of which proves fatal. And yet it will be said that the child died from teething, when dentition was progressing naturally, the gums were not swollen or tender to the touch, and there was no indication of any reflex nervous irritation.

Do not understand me as insisting that delayed dentition may not induce a train of symptoms somewhat analogous to these, but when fever and a slight diarrhœa are due to this cause, the diagnosis should not be difficult. In this case the disturbance will not be functional, but of a nervous character, and the gums will give timely indication and warning of the impending trouble. In by far the greater proportion of the diarrhœas, and the gastric forms of the diseases of young children, I am confident that a careful examination of all the attending circumstances will find that they are due solely to errors of diet. In my own clinics at the Medical Department of the University of Buffalo, I have scarcely met a case in which it was necessary to give the advancing teeth any alleviation whatever. Children have been presented for lancing of the gums, by mothers who were confident that all the little one's ailments were due to the cutting of its teeth. The family physician had perhaps told them so, but an examination of the mouth almost invariably found the gums in a healthy

condition, and the teeth progressing normally. No child was ever yet presented at my clinic whose food was exclusively the milk of a healthy mother. But I have frequently seen them when their stomachs were distended by the products of the indigestion of food that was lying, an absolute foreign substance, within them. Consider, gentlemen, what is your own condition when suffering from the eating of improper food, and then think what must be the state of a little helpless infant, with all its susceptibility to malign influences. Its stomach is loaded with that which cannot be digested. The presence of the mass is intolerable to the organism, and it must be eliminated in some way. Nature hangs out the signal of distress in the form of a rise of temperature, and a general febrile condition, if it be not vomited up. The mass acts as an irritant, producing a violent motion of the coats of the stomach, and it is perhaps passed through the pylorus into the intestines, where it produces increased peristaltic action, and so is hurried through, leaving the whole digestive tract in such an inflamed and angry condition that a diarrhoea of some day's existence is the natural sequence. This is repeated time and again, until a chronic condition of irritation ensues and the child dies of the exhaustion consequently upon it. Or, perhaps, the undigested food remains in the stomach, the powers of the child having been so exhausted by previous struggles that the mass cannot be eliminated. In this case convulsions will probably end the scene, and if one or two teeth be, as they usually are at this period of life, just making their appearance through healthy gums, they will be charged with the untimely death.

A thoughtful writer in one of our journals says. I do not ignore the potent agency of the various meteorological changes in the causation of these fatal diseases in the infant, but I am convinced that many more children would be saved during such changes if more attention were paid to alimentation as a prophylactic measure. Experience has taught me that in those families where I was allowed to

regulate the food of the infant, and where there was no departure from the rule laid down, the children passed through a very hot summer without being subjected to the ailments which are so disastrous to early life. If, however, parents are permitted to use their own judgment, or permit themselves to be influenced by the whims of some motherly neighbor, who scoffs at the present scientific dietary and boasts that she has reared a family of twelve children, and fed them 'from the table' when they were babies, then the physician might as well pursue the 'let alone plan' with almost a guarantee that his services will soon be required to pacify nature offended by a supper of bacon and cabbage."*

I have said that delayed dentition may produce symptoms that closely simulate those consequent upon improper feeding. How shall we distinguish between the two? Parents will consult us upon the advisability of lancing the baby's gums as a cure for its restlessness, pain and diarrhoea. It is important that we be able to set the family physician right, if he be wrong, and to determine with certainty whether there exists a necessity for the dentist's services. It is as essential that we know what to avoid, as to tell what to do. If we can demonstrate to the anxious mother that we fully comprehend the situation, we shall gain her respect and confidence, and she will be likely to heed our admonitions regarding other dental troubles.

A correct diagnosis can only be made with certainty after a very careful examination, not only of the child itself and the attending symptoms, but of its past history, its sanitary environments, and its diet. The age should be accurately determined, that it may be seen whether the dental development corresponds with that of the general system. This is important, because it is not infrequent that morbid conditions are ascribed to teething when the teeth due at the time are all in place. A medical journal

*S. S. Adams, M. D., "How Shall We Feed the Baby," *Archives of Pediatrics*, May, 1885, page 270.

reports a case of infantile palsy in a child more than three years of age, as due to teething. Both legs were cold and powerless. There was sufficient irritation of the gastrocnemius muscles to cause a permanent contraction, thus producing a kind of talipes equinus.† Nothing is said about the state of forwardness of the dentition, but unless it was unusually delayed, the physician in this case, as is too often done, jumped at his conclusions, and ascribed to teething a trouble that had a deeper origin.

The condition of the gums should be carefully noted. If they are normal, without any special inflammation or thickening, and if on the other hand they be not unduly tense and glistening, we should look elsewhere for the source of the irritation. It should be remembered that the gum is naturally very hard and dense, from the large amount of fibrous tissue in it. Normal growth, when the tooth is near the point of emergence, will find the gum whitish, glistening, and tense in appearance. There may be such a condition of impermeability, of toughness and hardness in the gum, that the advancing tooth is retarded thereby, and hence undue pressure is brought to bear upon the, as yet, insufficiently protected pulp, thus inducing reflex nervous disturbances, but I believe this condition to be comparatively rare. Unless there be constitutional and general disturbances that seriously interfere and require immediate attention, the tooth easily makes its way through the gums, by their absorption under the slight but continual pressure of the growing tooth. Should the contrary be the case, the remedy is a simple one; a crucial incision with the lancet over the point of the tooth, which will be easily detected, will give it egress, and the operation will be a painless one.

The general symptoms attendant upon this unusual condition will be of a nervous character. The child will have periods of irritability, and they will be paroxysmal in character. It will suddenly awake from a sound sleep with

†Medical Bulletin, June, 1883, page 196.

a frightened cry. There will be spasmodic twitchings of the muscles, more especially of the face. It may give indications of ear-ache. Its eyes will probably be watery, or possibly gummy. It will desire to bite upon hard substance, which will give it pain and cause it to cry out. Later on, however, this will change, and it will fear the contact even of the finger with the gums. There may be an increased or a diminished flow of saliva, or it may at one time be streaming from the mouth, and at another all the oral tissues may be parched and dry. All these symptoms will be, as before stated, paroxysmal in their nature, and it is this peculiarity which especially marks the condition. The bowels may be very irregular, or they may not be particularly affected. Sudden watery discharges may be succeeded by constipation. Their condition offers no very clear indication of the real cause of the trouble, for they may be in a comparatively normal state, unless there be gastric disturbances due to other causes.

A simple lancing of the gums over the advancing tooth, with the administration of a mild anodyne, will be all that is necessary. A four per cent. solution of the muriate of cocaine may be rubbed upon the gums, and this will afford a present relief, and by its action upon the terminal filaments of the nerves will frequently stop the muscular twitching, if this be present. Or the following lotion may be prepared and the gums bathed with it;

R

Hydrochlorate of Cocaine,	grs.	iss.
Tinct Saffron,	-	gt. x.
Syrup Simp.,	-	3 iiss.

I would advise a sparing use of the lancet if it be necessary to resort to it at all. The incisions need not be extensive, and they cannot be very deep, nor should they include the gum over teeth that are not manifestly retarded by actual pressure.

There is another and yet rarer condition of the oral tissues of teething children, that is of a more formidable

character. It is when the teeth are slow in their development, when they are retarded and roughened through constitutional or general derangements, and thus become a long continued source of irritation. The gums are then turgid, inflamed, thickened, abnormally vascular and tender to the touch. It will be remembered that in a healthy state they are the direct opposite of this; that they have but a limited blood supply, few nerves, have comparatively little sensation, and are hard, smooth, light in color and glistening in appearance. The abnormal condition to which I refer is easily recognizable at a glance. The salivary secretions is largely increased. The inflammation and redness extends into the pharynx, and finally down the alimentary canal to the stomach, producing gastritis, and an irritating, exhaustive diarrhœa. If the sanitary conditions be bad and the food of an improper character or insufficient in nutritive power, the disease assumes the type of a malignant stomatitis, or even of cancrum oris. The tissue of the gums becomes ulcerative, and sloughing ensues. The child becomes excessively debilitated through its inability to take nourishment, and from the diarrhœa which accompanies the condition there is a general malaise. The mouth is hot, the tongue coated, the breath offensive, the urine is high in color and scanty, and all the tissues of the body sympathize in the disturbance.

That these symptoms may possibly be induced by delayed and vicious dentition, assisted and aggravated by bad sanitary conditions, I believe to be indisputable. I have seen some of these in a boy of fourteen years of age, brought about by retarded eruption of the cuspids, for it is not alone the cutting of the deciduous teeth that may induce serious disorders. Hensch says that he "considers dentition, both first and second, to have much to do with their occurrence."*

The first remedial measures in these diseases should be directed toward the general system. Bad sanitary con-

*Goodhart. *Disease of Children*, page 88.

ditions should be remedied and strictest hygienic treatment instituted. The diet should be carefully regulated, and a moderate cathartic, followed by pepsin and dilute muriatic acid be given, if there be great digestive disturbances. If the symptoms are mainly oral, chlorate of potassium and muriatic acid should be given. The following local mouth wash may be used every hour:

Potass, Chlorate, gr. x.

Aqua Dist., f℥ i.

I have frequently, in analogous conditions, seen the happiest results from the use of Listerine one part, water ten to twenty parts. If there be ulceration, the surface of the ulcers should be swabbed with a saturated solution of permanganate of potassium.

When the condition of the mouth and the general system will warrant it, surgical interference may be demanded. A careful examination, with due consideration of the age and state of development of the other teeth, will enable the judicious surgeon to determine what tooth or teeth may be delayed and acting as the irritant. Under the influence of an anæsthetic, if necessary, or five minutes after painting the gum over with the fluid extract of *Cannabis Indica*, deep incisions should be made over the point of the delayed tooth, and the gum dissected back a little until its exact condition can be determined. If it be bound down by adhesions, these should be cut. If the tooth be presenting abnormally, or if it be so impacted that its development will only aggravate the existing difficulty, it may be necessary to extract it, but these are conditions that it is not my present purpose to discuss. Impacted teeth usually bring about a train of symptoms quite distinct from those enumerated, and they require radical surgical interference. I am not speaking of anatomical anomalies, but of those pathological conditions which may accompany the eruption of normal teeth. It will usually be sufficient, in the inflammatory condition considered in this paper, to make deep and free incisions down to the offending tooth or teeth, and

to cut or bur away any roughness of the surface that may be causing the irritation. I had occasion not long since to thus smooth the surface of two first permanent molars, whose enamel upon the crown was almost like a coarse wood rasp.

I have spoken of retarded dentition. This may occur because of a general lack of development, the teeth simply keeping pace with the growth of the rest of the body. There are but few constitutional diatheses which interfere with dentition. In inherited syphilis and in tuberculosis, the teeth are usually cut early. In chronic diarrhœa and in the weakness caused by improper food, the development of the teeth goes on uninterruptedly. There is but one disease in which general nutrition is affected, that seriously interferes with tooth growth, and that is Rachitis. Whenever the child is attacked by this, then development of the teeth is arrested. Eustace Smith says that this influence is peculiar to rickets. "If the disease makes its appearance before any of the teeth are cut, their evolutions may be almost indefinitely postponed. If some teeth have already appeared, the further progress of dentition is interrupted."*

It may not be unprofitable to glance at the symptoms attendant upon an improper diet, and which are in my opinion the usual cause of the so-called diseases incident to teething.

Diarrhœa is the most common of infantile diseases, and it is usually one of the first symptoms of a deranged nutrition. There are three elements which tend to produce this condition:

1st—The nervous reflex of dentition.

2d—Improper feeding.

3d—The unusual heat and moisture of the particular time of the year in which these attacks usually occur.†

I believe that the first of these is much less often a

*Wasting Diseases of Infants and Children, page 97.

†The Summer Ailments of Teething Children. Judson Bradley, M. D., *Detroit Lancet*, October, 1885, page 153.

cause than is usually imagined, but it cannot be altogether excluded. The third undoubtedly has its influence, but by far the greater number of cases of diarrhœa in children may be directly traced to errors in diet. At the age of eight or nine months, when the incisor teeth are making their appearance, most mothers and nurses commence the giving of more solid foods. The period is one of unusual peril, for it is one of transition. There are eras during which unusual progress is made, and the time of dentition is one of them. The young child is then peculiarly subject to disorders of many kinds: not as a consequence of the eruption of the teeth, but as a part of a general activity of growth and development, to which dentition and morbid phenomena both in a sense respond.*

At this critical period new articles of food, which the undeveloped nutrient organs are powerless to digest, are introduced into the stomach, and a portion passed into the intestines. Within a few hours the symptoms of indigestion are manifested. Perhaps there may be nothing more formidable than flatulency and colic of a mild character. Or there may be vomiting and purging for some days, with but little of febrile disturbances. If the bowels be not relieved the child becomes pallid, and is fretful and restless. A slight rise of temperature may be observed, and it is thirsty and will drink large quantities of water. The mouth is dry, the tongue red and furred, and its papillæ prominent. The evacuations become more frequent; they are liquid and perhaps green and offensive. Then the temperature suddenly jumps to 101° or 103° , and the evacuations become colorless, profuse and watery, with a sickening odor, or perhaps, they assume a pinkish color. These symptoms may be succeeded by a sudden collapse, the temperature falling rapidly, and death ensue at but a few hours notice. All these are the possible attendant symptoms upon a simple diarrhœa, the result of injudicious feeding, or they may follow as a train succeeding it. It will be seen that they

*Goodhart. Diseases of Children, page 29.

vary, in important particulars, from those given as the results of reflex nervous irritation arising from the presence of an unrelieved, advancing tooth, and from those attending the inflammatory state of the gums due to roughened, unerupted teeth. It is important that the varying conditions be kept clear in the mind, that remedial measures may be properly directed.

Cholera infantum has been by some authors classed as one of the diseases due to teething. It would seem that a little reflection should show the fallacy of this theory. It is not necessarily confined to the teething period, nor are the symptoms such as would lead one to infer dental reflex nervous irritation. A debilitated system, unhealthy sanitary surroundings, and an existing, or even a recent, gastrointestinal irritation, are the contributing or predisposing causes, while a continued high atmospheric heat, or sudden changes in a moderately oppressive temperature, and sudden changes in the diet, are usually the exciting causes.*

A healthy infant is suddenly seized with profuse purging and vomiting. The skin becomes moist and cold, the features assume a leaden pallor, the eyes are sunken, the fontanelles depressed, and the symptoms of an Asiatic choleraic collapse are present. It is from its resemblance to this latter disease that it derives the name of cholera infantum.

Malarial fevers are some times mistaken by the unthinking attendant for disturbances of teething. There will be vomiting and pain in the epigastrium, indigestion, with nausea and diarrhoea, sore throat arising from pharyngitis or tonsillitis, coryza, and some febrile symptoms. These indications need not, however, be mistaken for true cases of difficult dentition. It should be remembered that, in infantile malaria, the chill and sweating stages are always absent.†

*Cholera Infantum. William Perry Watson, M. D., *Archives of Pediatrics*, August, 1885, page 451.

†Malaria in Children: J. P. Kingsley, M. D., *Courier of Medicine*, August, 1885, page 108.

Stomatitis, thrush, and cancrum oris are diseases of the oral cavity that have no direct connections with dentition, though a condition simulating them may rarely be seen as the result of ragged, roughened, retarded teeth. Acute stomatitis is usually distinguished by a very offensive breath, and the spitting of bloody saliva. The pillow at morning will frequently be found stained with blood. It usually takes the form of a superficial ulceration of the edges of the gums, tongue and buccal surfaces, the gums being very vascular and covered with yellowish, deteriorated granulations. Sometimes it appears as widely distributed aphthous ulcers.

Thrush is a fungoid growth, which may be found upon the mucus membrane of the mouth. This fungus has received the technical name of *Oidium Albicans*.

Cancrum oris appears as a hard, indurated swelling in the cheek. This rapidly degenerates, extends and becomes gangrenous, eating its way through the soft tissues and destroying all within its reach. These last three conditions are usually found in ill-nourished children, with bad sanitary surroundings, and a lack of hygienic precautions.

There is one other disease to which I will direct your attention, and which in certain circumstances may be mistaken for dental disturbances. I refer to infantile convulsions. These frequently simulate the epileptic convulsions of older people. The child will scream or cry violently before the fit, when it becomes unconscious, with tetanic spasms. Sometimes there is a tremor in the sleep, twitching of the lips, sudden startings, the thumbs or toes rigidly flexed, with convulsive movements of the eyelids. These may resemble the reflex nervous spasms sometimes caused by tooth pressure, but the nice observer will be enabled to distinguish them through exclusion, and by noting whether they be general in character, or confined more especially to the connections of the trigemini.

Experience and careful examination will enable one to distinguish the comparatively few instances of general dis-

turbances caused by dental irritation. You have already learned that, in my own opinion, these cases are rare. "The child is teething," is the vague explanation given to many an anxious mother, by practitioners who are either incompetent to form a complete diagnosis, or too indolent and careless to seek for the hidden springs of disease; who are too heedless to carefully weigh all the symptoms, masked as well as developed, and who trust to luck for a verification of their hastily formed prognosis. I believe that this convenient make-shift has quieted the alarmed mothers and lulled the anxious friends of countless little innocents into a fancied security, and stayed the fears which might otherwise have instituted timely measures for relief, until, too late to save the little one, it was discovered that an alarming disease had attacked the vital organs, the very citadel of life. "Only teething." To how many promising young existences in which were centered the hopes, the ambitions, the hearts affections of a family circle, have these words sounded the knell. "Only teething,"—and the fond parents looked with but little alarm upon symptoms of the gravest character. "Only teething"—but when to their agonized ears came the sound of the clods of earth falling upon the little coffin, and they realized that with the words, earth to earth, dust to dust, ashes to ashes, the door which opened to a bright and promising future of years of comfort and happiness to be spent with the loved child when grown to manhood or womanhood was now forever closed, when all the world seemed, but one wide churchyard in which to bury from their sight their loved ones, in this hour of anguish would it alleviate their pain to know that a great mistake had been made—that a fatal error had been committed? And if, to the conscientious physician, the knowledge too late should come that, to save himself a moment's labor and thought he had lightly passed over indications that it was his duty faithfully to study, would not the sight of those grieving parents, the habiliments of mourning; "the knell, the pall, the groan, the tear," would not these

things rest heavily upon his soul? That you, gentlemen, may be spared such vain regrets, the lashings of tortured conscience consequent upon manifest duty fatally neglected, I have endeavored, so far as my poor ability permits, to point out to you the danger of mistaking grave pathological conditions for mere functional derangements.

ARTICLE II.

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK.

The First District Dental Society of the State of New York held a special meeting, Tuesday evening, September 22, 1885, in the rooms of the S. S. White Dental Mfg. Co., Broadway and Thirty-second street.

The president, Dr. William Carr, in the chair.

INCIDENTS OF OFFICE PRACTICE.

DR. B. C. NASH.—I have here a cast of the mouth of a patient, a young lady fourteen years of age, showing an unusual retention of temporary teeth and backwardness in the development of the permanent ones. In the upper arch are the permanent central incisors, bicuspid, and first molars; the lateral incisors and cuspids of the temporary set are retained, and the second permanent molars are still undeveloped. In the lower arch the six permanent front teeth are in position and also the first permanent molars, and on one side a second molar, but there is no indication of the appearance of the bicuspid, though the temporary molars on one side became loosened and were extracted about a year ago. The permanent teeth are generally of excellent quality, but much smaller than usual. I would like advice in this case, as I have heard of gentlemen who

invariably extract temporary teeth when the time for their shedding comes. I have not extracted any of these teeth, and am inclined to await developments before doing anything in the matter.

(The opinions given were in confirmation of this view, and the matter was passed.)

DR. W. H. ATKINSON.—Mr. President and gentlemen, I am about to present to you a paper which deals with a disputed point. I wish to invite your close attention, and I put you at liberty to stop me at a comma, semicolon, colon, period, or paragraph; and if I use a term that does not strike you as being relevant, stop me right there.

Dr. Atkinson then read the paper entitled

PYORRHOEA ALVEOLARIS.

"Flow of pus from the tooth-sockets" has long been recognized as a disease which it was impossible or difficult to successfully treat. Those who have dealt with it are divided as to the character of the departure from health, and as to the manner of treatment. Dr. Riggs regards it as a local disease, and amenable to local surgical cure; while many others, mostly homeopaths, attribute it to constitutional cachexy; and still others regard it as localization of a systemic debility. My own view is coincident with the latter.

The great merit of Dr. Riggs' practice is in his insistence upon the necessity for thoroughly removing *all* the altered tissues well down into the healthy structure, thus favoring reproduction by "first intention." His demerit is his persistent denial of any utility in constitutional or local medication.

All diversity of opinion respecting the diagnosis and treatment of this disease, and in fact of all diseases, lies in our tarrying in mere opinions, and acting as if they were well-established knowledge of nutrition and its aberrations. The various tissues of which the organs of the body are composed have characteristic degrees of form, density,

toughness, pliability, and extensibility, by which we are able to distinguish and describe them. All the tissues are supported by the process known as nutrition. Hard tissues feed slowly; soft tissues are more rapid feeders. Hence nutrient changes differ in facility and rapidity in the various tissues in health, as well as in difficulty and slowness in the ratio of departure from the protoplasmic state, in which the most rapid nutrient changes occur.

The bottom facts of nutritional changes are so occult, in consequence of the smallness of the bodies in which they take place, that few have the patience and earnestness to study them for themselves; and therefore nearly all the recorded information on this subject is a repetition of the crude mass-observations of beginners in this field of research which have found their way into text-books and journals, so lacking in coherence of statement as to make it difficult for any pupil to master them so as to give to them a hearty assent by comprehending the changes described, or to reject them as non-understandable.

Nutritional changes consist of play of affinities so fine and evanescent as to defy formulation in such coarse terms as abound in the books recording the apprehensions of those who have made them a study. Hence the prevalence of adverse estimates pronounced in such cases on the one hand, and of enthusiastic assertions of easy and simple cure resulting in "all" cases with only "one application" of the "remedy" on the other hand. I have seen so many cases of the latter class, which had been pronounced cured with "one thorough treatment,"—in which, by the way, there were teeth which were not only loose in the sockets, but which had fistulæ which were discharging more or less of the broken-down tissue,—that I feel bound to raise a warning voice against unwise confidence in the short, sharp, and quick method of treatment. Not that there are no cases so cured, but that so many supposed to be cured have proved to be only palliated and set back, to break out again when they were lost sight of by the operator who

had pronounced them cured, to fall into, sometimes, less competent hands.

Under these experiences we are led to suppose that different conditions have been grouped together as being the same form of disease, or that differing degrees of degeneration have been deemed to be alike amenable to one single remedy applied in one way, and that "my way."

I am convinced that we will not see eye to eye until these cases shall have been made subject to clinical investigation and demonstration such as has had marked success in the other branches of our art, viz., filling teeth and fitting regulating and restorative fixtures, now so far advanced toward perfection.

One of the greatest obstacles in the way of understanding the various modes of nutritional change is the classification by which those which belong together are named as if apart and distinct. All nutritional metamorphosis occurs in protoplasmic bodies, which are the elements of every form of nutrifying body which converts pabulum into tissue. Where protoplasm is not formed into tissual limitations, of neural, osseous, muscular, connective, or epithelial differentiations, the ameboid form of feeding holds the dominion of the field of nutrient activity, which in reality is the only condition in which these changes can take place. Therefore all foods must be reduced to the fluid state before appropriation is possible.

Atrophic dyspepsia of connective-tissue is the most difficult of detection, and is the first step in every case of pyorrhœa alveolaris.

The bond of union between the tooth and its socket consists of a connective-tissue layer attaching it on its inner border with the cement corpuscles, and on its outer border with the myxomatous tissue of the gum, which in turn is covered with an epithelial coat consisting of several layers of epithelial bodies of globular, cuboidal, cylindrical, and squamous conformations. The cement-substance connecting these elements of the tissues is nitrogenized hyper-

oxidized hydrate of carbon. In other words, the ameboid ectosarc is of such plasticity as readily to hold to or let go of its fellows composing protoplasm, mucus, blood, muscle, nerve, or epithelium.

To this fineness of interpretation, then, do we come at last to enable us to catch a glimpse of the territory in which the first divergence of health is displayed in every case of "pyorrhœa alveolaris."

Wasting of the cement releases the hold of the connection, which by the resilience of gum-tissue opens a gap at the point of death of ectoblastic structure. In this chasm various deposits may occur. Where inflammation is induced, it may resolve or proceed to suppuration or sphaecelus, caries or necrosis, according to the constitution and status of health of the body at the time. As a rule, the earlier and more manageable stages of this disease are not noticed by either the patient or the practitioner, and hence well-pronounced cases are those which generally apply for relief.

When a ripened germ is separated from the bed in which it was generated, the act may well be named "parturition." If, then, protoplasm be the first form in which the feeding process can be proved to occur, are we not justified in the assertion that rejection of excess of food and incompatible material is the first example of increment and decrement, of coming together and going apart, or impregnation and parturition of elemental bodies?

All the functioning bodies of which we have any knowledge are composed of elemental bodies too small to be seen. When any department is denied its normal demand for nutrition, the harmony of function is lost, and career of body thus minified is cut short or destroyed. When enough destruction has been effected to be detected, the case is ready for investigation, diagnosis, prognosis, and treatment, or abandonment.

Concretions of lime are never causal of disease; only concomitant or sequential. No two specimens of calcare-

ous deposit have yielded an identical analysis. They are the result of a breaking down of tissue-elements under stress of disease in which the acids requisite to holding the lime in solution are deficient in supply, or brought into contact with bases for which they hold higher affinity. The attempts to classify these deposits have resulted in a somewhat ambiguous nomenclature, viz., salivary calculus, serumal calculus, and sanguinary calculus.

The general term in common use to designate these deposits is "tartar," originating in a loose resemblance to the crust on wine casks called by this term.

Whenever a deposit is formed it takes the shape of the pocket in which it is precipitated from the fluid holding it in suspension. Take the example of the pocket produced by the recession of gum about the neck of the tooth from solution of the dental ligament, and we find the deposit to conform to the shape and size of the pocket, from a mere nodule to the segment of a circle, or to an entire ring about the neck of the tooth. Take a case of the so-called serumal or sanguineous deposit at the end, or near the end, of the root, where the solution of the connective-tissue corpuscles forming the pericemental tract has broken down the cement-substance which fuses the corpuscles into a sheet or membrane, and we find the nodules to correspond to the chasm formed by the retrogressive nutrient act in form and extent of the separated tissue. All calcareous deposits in an inclosed chamber necessarily arise from the precipitation of the lime in the locality, and must be from the circulation direct, or the broken down molecules and corpuscles of the tissues in the neighborhood. Deposits in open chambers may be from mucus, saliva, or free solutions of lime-salts, and may be properly named when we are able to determine their place of formation. The irregular composite calcareous bodies found in the respiratory, genito-urinal, and other circulatory tracts are easily understood so soon as their habitat is determined. The great masses of lime found in the lungs, the kidneys, the liver,

the joints, and the mouth are all very interesting subjects of study, and are developed under the general laws of nutrition by organic, tissual, corpuscular, and molecular chemistry, and are amenable to classification when their origin is ascertained.

If a calculus contains cholesterine, we refer it to the liver for origin; if carbonate of lime predominates, we refer it to the respiratory tract; if phosphates and urates are present, to the urinal apparatus, if the carbonates and phosphates be mixed with epithelia and heterogenous foreign bodies, it is referred to the mucous and salivary tracts for origin. Wharton's duct, Steno's duct, and the necks of the teeth are the places where we may find concretions of this last character, as instance the large masses so often found about teeth which are not vigorously used.

If what has been said be comprehended, there remains only a very short statement to complete this paper upon pyorrhœa alveolaris.

The three degrees or stages of this affection must be met by three degrees of extirpative energy: 1st, physiological; 2d, mechanical; 3d, chemical.

The first includes good feeding and hygienic cleanliness; the second, removal of foreign material by mechanical means; and the third, the destruction of ferments and their results by such means as kill the spores and their products and the debilitated tissue-elements, so that the physiological activities may throw off the offensive and effete matter and reproduce the tissues normal to the location.

To speak of the details of these methods of cure, and set forth their claims to attention, would involve the presentment of cases in the various stages and the special remedy to be resorted to in each. To give a mere hint of this labor, the best I can do is to give a former classification of application and remedy.

Where slight loss of the border of the gum is present, elixir of vitriol is the proper application to effect the purpose of inciting a return of physiological activity. Where

greater loss of connection between tooth and socket is present, with some lime deposit, use a solution of aqua regia, one part to seven of water. In cases of greater loss of attachment and loss of considerable portions of the alveolar plates, with or without foreign deposits, use caustic paste, made by melting together caustic potash ("potassa fusa") and crystalized carbolic acid, so as to make a homogenous paste, which upon cooling will be a solid and coherent mass, capable of being broken into bits of such size as to meet the demands of each case. Place these bits upon the site where you wish to form the eschar down to normal growth. The warmth will melt them and allow the affinities between this remedy and the altered tissues to convert all the dead and dying parts into a scab or eschar, which will form the limit of the pocket where sloughing occurs, into which the new protoplasmic exudate will form the clot out of which to secure the new growth. Wherever the parts press upon the locality so as to prevent or displace the exudate, a fixture must be resorted to to secure the clot in place long enough to enable it to be metamorphosed into the tissues normal to the part, from protoplasm (the clot) to embryonal corpuscles, myxomatous, connective, neural, vascular, and epithelial tissues, beneath which the new osseous growths will reproduce the sockets of the teeth.

DISCUSSION.

DR. FRANK ABBOTT.—I wish to congratulate Dr. Atkinson upon the excellent paper he has presented to us. While I differ with him upon some points in treatment, still I am sure he has given us most valuable thoughts for consideration. There are some parts of it, perhaps, that few of us understand clearly, and it may take us many years to get to the point of understanding them as he does. He commences his paper with Dr. Riggs' treatment of this disease, which is known among dentists, to some extent as "Riggs' disease." To me this is a very unsatisfactory name, and I never use it. There are so many ways of

treating the different phases of this disease that it would be necessary to present cases in order to come to any definite conclusion as to what we can and should do in any particular case. As for the surgical treatment, properly speaking, as practiced by Dr. Riggs, I believe it is too severe. I do not think there is any more necessity for cutting into the soft tissues, or attempting to cut away any portion of the alveolus, than there is for cutting into the gum outside or the tissues in any other location in the mouth. I have never yet seen a case in which the alveolus could be reached with an instrument without first cutting through the soft tissue. That Dr. Riggs does cure some cases of this disease by local treatment is probably true, for there are cases where local treatment is all-sufficient, and Dr. Riggs, or any other man, if he thoroughly cleanses the teeth from the deposits about them, will frequently get a return to health without any medication. But this will not hold good in all cases. In the cases I have had under treatment I have found no necessity for using sulphuric acid, aqua regia, or caustic potash, for the reason that, although I have not cured, I have relieved every case that I have had to do with without such severe treatment. That an absolute cure can be effected with the above-named remedies, leaving no necessity for further treatment at any subsequent time, is in my opinion claiming altogether too much. *Pyorrhœa alveolaris is never cured*,—i. e., the normal conditions of the parts restored. That it can be relieved for the time being, and may appear to be cured, I know is true; but the same condition that first developed the disease still remains in the patient's system, notwithstanding the treatment, particularly if it be altogether local. Now, the same primary conditions existing, the same results will recur unless the case is followed up and the treatment repeated every few months, certainly as often as once or twice a year.

I have heard it stated that cases of *pyorrhœa alveolaris* occur without any deposit whatever upon the teeth, and also that this disease was entirely and emphatically due to

some constitutional taint which produced the disturbance in the gum and interfered with its nutrition, causing the gum to detach itself from the necks of the teeth and leave an open pocket, without having, however, any deposit around the roots of the teeth, either calculary, serumal, or sanguinary. *There is some deposit on the teeth in every instance that I have ever seen.*

The doctor spoke of the pericementum or membrane attaching the root of the tooth to the parts adjoining. I heard this last summer quite a labored paper, taking forty-five minutes or more in the reading, and very vigorously read, too, in which it was attempted to establish what was claimed to be a fact that there were two membranes surrounding the root of a tooth. This, I believe, from actual observation under the most powerful microscopes, has never been proved. Possibly I may make a mistake, but I have never yet seen it, although I have examined this membrane many times under the microscope, and those who are best acquainted with that tissue, and who have studied it longest and most carefully, are of the same opinion. The paper I refer to was read at the meeting of the American Dental Association at Minneapolis, and, I think was not discussed at all.

From one statement made by Dr. Atkinson, as I understood it, I got the impression that he wished to imply that in pyorrhœa alveolaris the alveolus surrounding the root of a tooth commences first to "waste away;" that the gum, in consequence, loses its attachment to the neck of the tooth, leaving an open pocket. Possibly that may be the correct idea, but my impression has always been that the gum first became inflamed to such an extent that its nutrition was interfered with; want of nourishment caused it to detach itself from the neck of the tooth, and thus a pocket was formed. This is what occurs in cases of salivation. The gums become diseased because nutrition is interfered with, and their attachment to the necks of the teeth is destroyed. I have heard the statement that no case of pyorrhœa alveo-

laris ever occurred except where the patient had been salivated. Whether this is so or not I am not ready to state, but I believe that every person who has been salivated suffers more or less from this disease. I have been of the opinion, and am still, that under the irritation caused by deposits at the margin of the gum the pericementum throws out lime salts which, mixed with epithelial scales and particles of food, are deposited upon the roots of the teeth, forming what we call tartar. In my treatment of all cases of this kind I have depended almost entirely upon a careful use of my instruments and the perfect removal of the deposits from the teeth, making them as smooth as I could, and simply washing out the pockets with a weak solution of carbolic acid. I believe that by this treatment I can accomplish all that can be accomplished in any way with a disease of this kind.

DR. J. L. WILLIAMS.—I don't think that I can add anything to the remarks that have been made; and it is pretty difficult to add anything to the aphoristic statements of Dr. Atkinson. If I were to say anything at all it would be in the line of a kindly criticism of the remarks of that gentleman, with an interrogation point at the close.

It seems to me that there is a great deal of difference of opinion and mystery hanging around the real nature of the trouble itself; and the treatment, of course, differs according to the conception of what the trouble is in its origin,—whether it is purely local, which it seems to me is a contradiction in terms, or whether it is a local expression of a constitutional disturbance. The view that is taken of the disease will determine the treatment. If it is a purely local trouble, surgical treatment is all-sufficient. But it can hardly be that, even if the immediately antecedent deposit of lime-salts around the teeth were sanguinary or salivary, because even that deposit indicates a perverted physiological condition somewhere in the body. If, as Dr. Atkinson says, the immediate antecedent of pyorrhœa be atrophic dyspepsia of the connective-tissue elements, then it must be

a local expression of a constitutional disturbance. If that is true, that it is a local expression of a constitutional disturbance, what right have we to expect local treatment alone, whether it be surgical or medical, or both combined, to prove more than palliative? Of course, the progress of the disease in most cases is slow. The advanced cases have been a long time in coming to the condition in which they are found, and a purely local treatment, either surgical or medical, will for a long time palliate the difficulty; but if the disease is a local expression of a constitutional disturbance, then it seems to me that such treatment must be purely palliative, and that it is not scientific to say that a cure has been effected by it. If the treatment springs from some constitutional disturbance, is it not sure to return unless that constitutional disturbance be corrected?

DR. ABBOTT.—I did not make any statement in reference to what I believed the disease consisted of; but I do believe it is a local expression of a constitutional disturbance, just as the reader of the paper does. I have not any doubt that judicious constitutional treatment might do a great deal towards relieving these cases. What that constitutional treatment is or should be is a question that we have yet to determine positively. I would like to ask Dr. Atkinson what constitutional treatment he adopts in such cases, if any.

DR. ATKINSON.—I almost invariably use constitutional treatment. It is only those cases that are very well endowed with good blood crisis that do not need constitutional treatment. Nutrition is the only means of cure. That goes without saying. That is physiological and pathological common sense. We know that everything that feeds must have something to feed upon, and if it feeds upon something in order to live, that which is called life must be transferred from the food to the feeder.

DR. ABBOTT says he understood me to say that it was the alveolar process that was first involved in this disease. If he will read the paper when it comes to be published, if

it shall be accorded that honor, he will see that I said atrophic dyspepsia of the connective-tissue was the first step. I mean—not the cementum, which we say constitutes the modification of the bone that makes the connection around the teeth—I mean the estosarc, or outside skin of the ameboid body which we call the connective-tissue corpuscles, and which makes the lining of the socket and the tendons of the body. It has that peculiar waxy surface that enables those elements to be fused together, and that constitutes the tendons and the membranes. It is precisely the same as when you get a hang-nail; the first point that you tear away breaks the connection and leaves a hanging part. The reason why we don't understand these expressions of disease is that we have been looking at a mass of tissues in organs and not at the molecules which constitute them.

There is not a man in medical practice that is worth a snap to give advice in these cases. I saw that in one fresh from school at the Minneapolis meeting. Western men, although they follow the old text-books, are willing to learn and to ask assistance from whatever source they can get it. They take us to be worth something, and they invite us to examine their cases, but we found them still pursuing the treatment laid down in the books, and following what was given up as effect years ago. They were poulticing periostitis of the jaws and alveolar abscesses.

I want to fasten upon your minds the growing necessity for the dentists of this city to establish a free hospital into which everyone who is suffering shall be able to go and receive intelligent treatment, where we shall demonstrate the very best ability of the profession, and join in having such clinics as we have never yet had; where we shall have such diagnosis, treatment, and cure as have never yet found pronouncement on this planet. When we shall have such an institution as I hope will be established in this city, so that we can have those things brought before the minds of all and get the best light on them,

where we can pool our issues and let every man have the benefit of the best ability and work, then we will make a splendid advance. I wish I had time to make the demonstrations as clear to your minds as they are to my own. It is the nutrition of the five tissues that constitute the human body that we must understand, and know how the food we eat is converted into pabulum, how that pabulum is converted into blood, how the blood is transformed into protoplasm, and protoplasm into embryonal corpuscles, and embryonal corpuscles into the various tissues that constitute the organs of the beautiful machine that we call the human body, and which stands, according to the old Greek word *anthropos*, with upward-turned face.

The treatment for all patients that you will see, with the exception of about one per cent., will be to give a two-grain pill of the sulphate of cinchonidia night and morning. I have some patients who have pursued that treatment for four years. If they are at all nervous, then take McKesson & Robbins' nux vomica, phosphorus and cantharides, one pill each day, in addition to the four grains of cinchonidia. Some patients require a little more, some a little less, but it is not often that they require less than that. Why do we give cinchonidia? I have a suspicion that what we agree to call cruorin, which has a red color and means a red corpuscles of the blood that is carried through the system for its use, is so nearly like the sulphate of cinchonidia that there is no chemist who has been able to show the difference. Hence I take it that this cinchonidia is readily convertible into the cruorin which constitutes the red blood-corpuscles of the blood.

The treatment I have indicated is the general treatment. I can show cases of school-teachers who were all "played out" when they came to me, and who are now in full health and happy. I have named the simple prescriptions that I have given for a long time. There are other prescriptions, such as elixir of vitriol,—half a teaspoonful in a wine-glass of water, to be given at meals to people

who are all played out. There is another remedy to which a gentleman in this room, I think, owes his life, and that is aqua regia,—five drops in a glass of sweetened water, or ten drops to be taken after each meal for one or two weeks; then to be repeated after an interval as may be required. Then you get a gastric juice that does its work.

DR. G. W. WELD.—In cases of anemia does the doctor use chloride of iron?

DR. ATKINSON.—Anemia is a deficiency of the blood. I have given you my idea of what cruorin is. That is the element that is most likely to be lacking. Don't fool yourselves any longer with that notion about iron. There is iron enough in every article of food you eat to supply all of that element that can be used in the body. Iron is not incorporated into the body outside of the blood, in which its special purpose is to make a magnet of the red corpuscle and to invite the oxygen to hang about it for transportation throughout the circulation, to effect the purpose of nutrition, which is combustion. Young muscle is light colored; old muscle is a deep color. Beef is dark in color, and veal light; and that is the key to the destruction of the blood-corpuscle in the nourishment of the muscle in which the cruorin is deposited that gives it its deeper color. Of all the multiplicity of remedies that we use ashes are the active principle. What are ashes? Ashes are the oxides of metals and metalloids.

DR. WELD—I presented at the clinic this afternoon a case of lupus erythematosus of the lips, in which there is, as you know, a peculiar functional activity. It is what is sometimes termed scabbing of the lips. The skin peels off every twenty-four hours. There seems to be at times no help for this. Whether this malady be a local expression of a constitutional disturbance or not, I do not know. In this case the patient is forty years of age; he has no scrofula, and no specific taint; he never tasted a glass of liquor in his life, nor did he ever smoke a cigar. He is a powerful man. Evidently his blood contains a great deal of iron,

and yet he has been under the care of one of the best New York physicians, who is unable to cure that little disease of the lips, which at least comes under the head of lupus erythematosus. It may not be exactly that, but it resembles it, inasmuch as there is a chronic hyperemia of the parts accompanied by an apparent new cell-growth. Now, what is the difference between this case of chronic disease and one of Riggs' disease? It is simply a want of functional harmony. In one case you have something resembling atrophy, and in the other hypertrophy, and they may be both local expressions of constitutional disease. Regarding the treatment of Riggs' disease, I believe that every intelligent dentist and physician looks to the general health of his patient and prescribes for anemia if that treatment be indicated. Whether you use iron or any other one of the restorative agents for increasing the red blood-corpuscles, if you improve the general health by so doing, you must necessarily relieve the local disease. As far as the mechanical part of the treatment is concerned, I do not think it necessary to say anything. Every gentleman present knows, I think, how to use the instruments and use them skillfully.

DR. ATKINSON.—I saw that case. The doctor says the patient is not of a strumous habit. He has the thick blubber lips that belong to the strumous habit. My impression is that a solution of salicylic acid in alcohol, properly diluted or of full strength, to paint the lips and cook the epithelium so as to make a scab and allow the parts underneath to heal, will work entire cure in that case. That it has any of the characteristics of lupus I did not discover. There was no eating about it. Lupus means a wolf, and all the cases of lupus that I have seen have had a ragged edge as though they were eaten away. They are not very malignant until they have been a long time in the system and have been given opportunity for deteriorating the pabulum that is to be transported to other parts of the system. Adjourned. B. C. NASH, D. D. S., *Secretary*.

—*Dental Cosmos*.

ARTICLE III.

HYDROCHLORATE OF COCAINE.

BY DR. GEO. WATT.

[Read before the Ohio State Dental Society.]

Debarred from active practice, it is not strange, perhaps, that we have neglected to give this agent a practical investigation, especially as the relaxed and painful state of the nerves inclined us to not only put off till to-morrow that which could be done to-day, but to postpone, indefinitely, all that the force of circumstances failed to drive us into at once. Lately, however, we have given a little attention to the matter, most of our experiments being made with a four per cent. solution.

We got started into the investigation in this way: In the summer a bicuspid tooth became very painful from inflammation in the socket. Dr. Sillito applied the cocaine, and extracted it painlessly. True, it was not hard to extract, but would have been a very severe operation without the medicine.

Further, about a month ago we raised a crop of bastard boils, a cross between boils and abscesses. While passing through the abscess stage of *locomotor ataxie*, we were in the habit of taking nitrous oxide when a very deep abscess was to be cut into. These small affairs seemed not to justify such a course, and yet they were so excessively painful, and on a surface having a high degree of hyperæsthesia, that we lacked the courage to cut into them, "just as they are, without one plea," and so we put about four minims of the four per cent. solution into the hypodermic instrument, placed the point of the needle with the beveled opening lying on the boil, a little to one side of its apex. A gradual introduction of the point between the cuticle and

cutis vera enabled us to force a minute portion of the solution on the surface of the latter. Waiting a brief period, we then elevated the body of the instrument, and pressed the point of the needle through the skin, at the apex of the tumor. The solution was then forced under the skin, and, in a brief period, a cut through the skin was made, without pain. This was so satisfactory that the entire crop was harvested in the same way. We used from three to five minims of the solution in each operation.

While the preponderance of testimony establishes the local anæsthetic properties of this agent, so many have reported failures, that we have tried to find out the cause of such discrepancy. Mistakes in preparation, or the use of inert materials may, in part, explain. But we have seen no notice of careful experiments to determine the time required to produce the anæsthetic state locally, by this drug. One man said he had waited eight minutes, and made partial failure, but suggested that if he had waited twelve, he would have probably succeeded. Others have waited four minutes, and various results are reported. We are inclined to think these delays are too long. At each successive operation, in opening the boils, we reduced the interval between the application and the cutting, and had quite as good, if not better success with the last than with the first.

Then we determined to find out something definite about this. Selecting a highly sensitive surface of sound skin, four minims of the solution were injected immediately under it, and the surface was tested by sudden pricks with the hypodermic needle, deep enough to allow a ready and rapid escape of drops of blood. And this was painless, while similar pricks at a distance were quite painful. At the first trial we waited two minutes, and repeated the experiment day after day, (as we didn't want much of the solution in the blood at once, as it was not known what it might do,) and we kept on till the delay was but thirty seconds.

Next we thought of our Cocker Spaniels. Injecting the

solution on the under surface of their ears, we proceeded to interpret their "dog latin" as faithfully as we could. One of them shrieks from the slightest hurt, except in a fight, and the other is so impatient that he bites, as an argument for release, for equally slight hurts. When introducing the needle, both gave expression to pain, but after twenty seconds with one, and nine seconds with the other, each was quite indifferent to thrusts of the instrument in the vicinity of the point of insertion, even though these thrusts penetrated entirely through the skin. We regard this as valuable testimony, and it seems to indicate that too much time has been spent in waiting for the anæsthetic action of the medicine.

May it not be that in waiting five, and especially eight minutes, the local effects has been, in great part, lost by the absorption of the medicine into the general circulation.? Absorption varies in rapidity with the nature of the tissues involved. But, as a general rule, it is more rapid than is usually supposed. Let each reader inject ten to twenty minims of clear water under the skin, where it is reasonably thin, with more than the average quantity of loose cellular tissue beneath it, and watch the process of absorption, and he will receive instruction. The same phenomena will be seen if the injection is made at any point, but tissue, as above described, gives better facilities for observation.

A very intelligent and rather aged physician, who has been a great sufferer from neuralgia in the region of the sacrum, and along the sciatic nerves, writes us that, in his desperation, he had injected ten minims of the four per cent. solution, alternately over the origins of the sciatic nerves, making two injections a day, and that these controlled the pain, and that the relief was noticeable within five minutes after the introduction of the medicine. He had given this treatment but a few trials at the time he wrote to us, but its prompt action, and the uniformity of results thus far, seemed to inspire him with hope that he would derive some permanent benefit from it.

We hope that carefully conducted experiments will soon tell us more about this valuable medicine. Yea, verily; for we need light.

Since writing the above we repeated an experiment in a

modified form. Fifteen minims of water, and five minims of the four per cent. solution were mixed and drawn into the hypodermic instrument, and inserted into the forearm, partly to find out if it would relieve a very severe neuralgia of the occipital nerve, and partly to investigate the local anæsthetic effect. In forty seconds we began thrusting the hypodermic needle into the prominence caused by the injection, passing it quite into the cellular tissue. Eight thrusts of this kind were made within two minutes, and alternately the point of the needle was pressed against a finger-nail, with force enough to have penetrated the skin. The operations were equally painless.—*Dental Register*.

Editorial, Etc.

FORTY YEARS AGO.—*Mode of Treating Pulpless and Abscessed Teeth, after the Pulp has been Suppurated, or where it has been destroyed with a view to this Operation. By Samuel Rambo, M. D., of Montgomery, Ala. Reprint from New York Dental Recorder.*

Prof. C. A. Harris:

DEAR SIR: "Situated as I am," with a mixed practice from town and country, patients sometimes present themselves that *cannot* undergo the necessary medical treatment laid down by authorities, preparatory to the operation of plugging. Many come from a distance, and, having no idea whatever of what is really necessary, insist on an operation being performed *immediately*, though a nerve may be exposed and suppurating, or an abscess already formed in the gum and alveoli.

Some, with teeth thus situated, *decline* extraction, from "certain states of constitutional health, and the fears of timidity of the patient," added to what they conceive to be the proper operation to be done. They are averse to extraction, or any mode of treatment that would require more than an hour, and plead distance, inconvenience, and what *they* "think about it."

Science "goes to the wall," if the usual operation of plugging is performed, and an abscess, with its influences, *established*, as a "fixed fact."

I am sometimes consulted by patients who are threatened with alveolar abscess from the suppuration of the nerve-pulp, after the tooth has been filled, and when the crown is still strong, well-formed, and of good color. In such cases I sometimes think it advisable to attempt the preservation of the tooth, and more particularly where the patient is opposed to extraction, or a regular course of medical treatment of the nerve, as proposed by yourself, and Drs. Maynard and Baker.

Under these circumstances, I have a compromise operation, which the above necessities have induced me to adopt, and although it may be known to many operators, yet it is comparatively new practice with me, not having performed it until within two or three years past.

The operation I propose, I think advisable where a radical cure of abscess cannot be effected by excavating the fang, and the use of injections, or where there is any uncertainty in regard to the condition of the sac.

It is very difficult to insure a cure under the most favorable circumstances, and cases do occur where the aperture through the apex of the fang is so small, that injections cannot pass in quantity sufficient to produce the desired result.

I have no doubt but that the practice of filling the fang is founded on correct views, when an abscess has never existed, and when the nerve and alveolar-dental-tissues have not suffered from the effects of arsenic, or other agents used for the destruction of the nerve within the root, and where a healthy cicatrix of the nerve has formed. If there is no inflammation or secretion, there can be no abscess, and I cannot imagine how the filling of a tooth in this condition, could produce it. But my practice applies to cases where there is danger of an abscess forming at the apex of the fangs, in teeth that have been filled, and have subsequently lost their vitality, or in cases of abscess from other cause, where the periosteum of the root has been but little injured, where the patient refuses to have the nerve cavity treated, or where, from the nature of the case, delay is unnecessary.

The following is my plan of procedure, viz.: The gum of the affected tooth may, or may not, be split, as circumstances may require, in order to pass a small drill under the edge of the gum into the nerve canal, directing the drill a little upward towards the apex of the root; when the nerve cavity has been reached, introduce a small, flexible wire up to the apex, if possible; pressure should then be made over the region of the abscess, or swollen point, and the pus forced through the nerve canal from the sac, and discharged through the drilled aperture under the edge of the gum. The old fillings, if any, should next be removed; the nerve cavity freely opened, and the remains of the nerve, and discolored bone, if any, removed. The canal to the apex of the root, should be thoroughly cleansed, and injections used of water, and sol. nit. aegt., or other astringents, forcing them through into the sac, if possible. The external abscess should then be opened, and injections thrown in; after this treatment, the tooth is ready for the filling.

A piece of strong wire, the size of the drilled aperture, should now be introduced through the same, far enough to prevent any gold foil from passing beyond it, and protruding a little; it serves, also, as a point of resistance for the consolidation of the first portion of the plug. The plug is then finished in the usual way, and the wire, (which should be of gold) withdrawn by pliers, or other instruments.

After the operation, the pus that may form in the sac finds a new channel of escape, and decreases in quantity, as the sac, from not being distended by accumulation, decreases in size; the external abscess heals, the adjacent tissue become more consolidated and healthy, and future abscess avoided.

The gum, acting like a valve, allows the secretions to escape, but prevents the entrance of matter from without. Finally, the pus becomes almost imperceptible in quantity, from the contraction of the sac, and the tooth answers about as good a purpose as ordinary pivot teeth, but preferable, from the fact that the natural crown is preserved.

Have you any experience with this plan of treatment? If so, I should be pleased to hear your views on the subject.

I am yours, very truly,
MONTGOMERY, Feb. 1st, 1850.—*Southern Dental Journal.*

SAMUEL RAMBO.

THE INTERNATIONAL MEDICAL CONGRESS.—We have repeatedly drawn our readers' attention to the progress made, both upon this side and the American side, in the direction of forming an effective arrangement for the holding of the Congress. As was pointed out, there was at one time a most hopeless state of affairs. Internal, we might almost say petty personal, interests were introduced, which were wholly foreign to a congress of scientists, which should, above everything, be cosmopolitan. The section devoted to Oral Surgery and Dentistry was, while these evil counsels prevailed, left out in the cold limbo of neglect. Dentists, we were shrewdly told, were not medical men (?) and so had no right to a place in the deliberations of those learned in the lore of medicine, or expert in the craft of surgery. However, happier and wiser counsels have now won the day, and the section in which our profession takes the most interest has been reinstated. The vast importance of the International Congresses cannot be justly appreciated unless by those who have carefully attended the meetings, and assiduously *set themselves to learn*. That America is to be the next meeting place will, unless we are much mistaken, prove of considerable importance to us dentists. The conflict between English and American dentists is still keen; we on this side have yet much to learn, and we stand an excellent chance of gaining the needed information, if we avail ourselves of this opportunity of going across the Atlantic rollers. The assumption of the Presidential chair in the section devoted to oral surgery, by Dr. Taft, is matter of congratulation. The programme of that section has not at present reached us, but we have little doubt that it will be all it should be, and will afford everyone a chance of putting on record the results of his work and experience. The rules regulating the business of the Congress are fair, and open to only friendly criticism; we append the more salient ones for the perusal of our readers.

To urge upon our English dentists "to be up and doing," will, we hope, be a work of supererogation, but it seems that as a body, they are very modest and very retiring. This is a pity. A man owes it alike to himself and his profession and his country to take some part, even if it be only that of a hearer, in all such international meetings. The Congress at

Copenhagen can hardly be considered to have been a success, so far as we are concerned. It is often and often deplored that we dentists do not get our deserts; we are ourselves to blame for this. The world is apt to accept a man at his own valuation, or a few figures below that estimate, and so if we persistently hold our tongues and show no signs of intellectual life, while America is plethoric with skilled dentists, who are likewise skilled workers, and not less important, skilled talkers, we must necessarily gain the character of being mere office drudges. The epithet will be said to show base ingratitude when there are so many leaders of men among us, who attend meetings, read papers, and teach the scientific side of our profession. It is not so, however; for if the names of the few who do thus distinguish themselves be scrutinized, they will be found to constitute a very minute minority of the possible number of men who could, if they chose, do something to forward the profession, and add to its laurels. There is yet another motive, although a sordid one, which should induce English dentists to pay more heed to our advice. The more men show the world of what material they are made, the more will the world think of them, and learn to value at its due price the services of skilled and scientific dentists.—*Editorial in British Journal of Dental Science.*

ORAL AND DENTAL SECTION OF THE NINTH INTERNATIONAL MEDICAL CONGRESS.—So far as we have observed, the journals in different parts of the country devoted to the interests of oral and dental science and practice, give expressions of cordial approval of the present preliminary organization of the Congress, and especially of the organization of the Section of Oral and Dental Surgery. The only exception we have noticed is that of the *Independent Practitioner*, published at Buffalo, whose editor, in the December number, has the following singular statement: "Following this (the meeting of the Committee on Organization, in Chicago, in June last) came the announcement that the Section of Dental and Oral Surgery was, by the reorganized Committee, abolished, and that dentists would not be welcomed to the Congress, upon the ground

that such medical men as had devoted their lives to the consideration of diseases of the oral cavity were not engaged in the legitimate practice of any branch of the healing art."

It is a sufficient answer to all this, to simply state the fact that no such announcement was ever authorized by the "reorganized Committee," nor by any other party representing the American Medical Association. On the contrary, the latter body had fully recognized the relations of dental and oral surgery to the general field of medicine and surgery several years since by organizing and maintaining a Section in that department on the same level with all its other Sections. The simple facts are that the Committee of Arrangements at its first meeting in June found nineteen Sections organized, which it was then thought was a greater number than could be accommodated with convenient rooms in Washington, and more than had been provided for at any of the preceding Congresses. Solely for the purpose of reducing the number, propositions were made and temporarily adopted to discontinue the Sections of Mental and Nervous Diseases, of Gynecology, and of Dental and Oral Surgery, leaving the workers in those departments to take their places in the Sections of General Medicine, Obstetrics, and General Surgery, respectively. We say temporarily adopted, because neither the revision of the Rules nor of the Sections was completed and finally adopted by the Committee until its second meeting, in September, when, after more consideration, all the three Sections, the discontinuance of which had been proposed, were retained without a dissenting vote in the Committee; that of Dental and Oral Surgery without the change of a single officer. And there is every indication that the Section will be sustained with a degree of enthusiasm that will not only do credit to the many scientific workers in that department, but will also aid much in restoring that department to its proper place, as a legitimate branch of the healing art, much to the benefit of both specialists and general practitioners; and it is to be hoped that this Section will be made so eminently successful that no Congress hereafter will be considered complete without it; for we agree fully with the renowned Virchow, that no one department can be isolated altogether without detriment to the whole.—*Journal of American Medical Association.*

Monthly Summary.

DISGUST FOR DECAYED TEETH.—We recall the case of a gentleman of ability, and an earnest Christian worker, who began a worthy enterprise of some magnitude, that would be advanced by the recognition and encouragement of prominent men in the same line of effort, and he presented his plans to a man of national reputation for his endorsement, and the gentleman refused to have anything to do with it. In speaking of the matter to a friend afterward, he said, in explanation of his refusal, "What man can accomplish any good who has a mouth in such a condition, sending forth pollution at every breath?"

First impressions are very forcible, and this man will have none but a poor opinion of the good man who sought his assistance. With the work he was in sympathy, but with the medium he had disgust.

Some people are too lazy, and others think they are too busy to properly care for their teeth by brushing and cleansing them regularly; but if people could only see the condition of their mouths and teeth as easily as they can see the condition of their hands, there would be less carelessness in this respect. As a result, there would be less toothless men and women, or what is worse than toothless, people with their mouths filled with decayed and broken teeth, that stare out at the beholder like the skeletons of departed friends, standing in ghastly array, in the cavern that has become their grave.

The only rule that will apply always and everywhere for the preservation of the teeth in their natural condition, is *scrupulous cleanliness*, and even this will not always accomplish that result, but if begun in childhood and continued unremittingly there will be very little demand for the services of

the dentist in extracting aching teeth. However, the teeth will decay to some extent and it becomes necessary to preserve them by artificial means, that is by filling, and every person, from the age of six years upward, should visit a competent dentist once or twice a year and have the teeth examined thoroughly, and, if any decay shows itself, have it filled at once. It is well, in this matter, to have a family dentist, just as you have a family physician, and always consult him in matters pertaining to the teeth or mouth.—*Health and Home.*

ZINC CHLORIDE AS A DISINFECTANT.—Dr. George H. Rohe has a note in the *Medical News* on the value of chloride of zinc for disinfection. Koch pointed out the fact that this salt is a very inefficient germicide. anthrax spores developing freely after exposure to a five per cent. solution.

Mr. A. N. Blythe says that a one per cent solution seems to stimulate the development of anthrax spores, and that it requires a twenty-five per cent. solution to arrest their growth.

On the other hand Dr. Sternberg found a two per cent. solution destructive of the micrococcus of gonorrhœal pus, while a one-half per cent. solution arrested the development of the septic micrococcus. Moreover a five per cent solution destroyed the organisms in broken-down beef-tea. As the latter organisms were supposed to be as resistant to most germicides as those of anthrax, Sternberg, with assistance of Dr. A. C. Abbott undertook another series of experiments to clear up the discrepancy between his results and those of Koch. These experiments showed that the spores of anthrax are not killed by an exposure for two hours to a ten per cent. solution of chloride of zinc, while a five per cent solution, acting for the same time, was effective in destroying the spores of a broken-down beef-peptone solution.

The result of these experiments is to show that a five per cent. solution of zinc chloride can be relied upon to destroy micro-organisms in the absence of spores. To destroy the vitality of anthrax spores, a twenty per cent. solution is necessary.—*N. W. Lancet.*

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ARTICLE I.

REPORT ON DENTAL LITERATURE AND
DENTAL EDUCATION.

BY W. W. H. THACKSTON, M. D., D. D. S.

(Read before the Virginia State Dental Association, October 6th, 1885.)

Mr. President, and Gentlemen of the State Dental Association:

In discharging the duty, and, as best I may, fulfilling the trust you have devolved upon me, I take pleasure in reporting a very satisfactory and encouraging condition of our professional literature. Valuable and important contributions have recently been made, and marked and decided advantages accomplished by new and largely original standard works in the several departments of dental science; and new and fresh editions of the older recognized textbooks have been brought out, with such corrections, emendations and additions, as were demanded by the present needs and status of our department of the "healing art."

The grand old works of Harris, the father and founder of scientific "American Dentistry," have been ably and faithfully revised, pruned, amended and added to, until they now comprise an encyclopædia of dental science and knowledge. A new and improved edition of Garretson's "Oral Surgery" brings that masterly work to the front as the embodiment of the latest advances and improvement in our surgical domain. Bond's "Dental Medicine" has been supplemented and succeeded by the more elaborate and comprehensive work of Prof. F. J. S. Gorgas. Kingsley's "Oral Deformities" is a well-nigh exhaustive treatise upon that important part of our art, in which the accomplished author has achieved a world-wide renown. Taft's "Operative Dentistry" and Richardson's "Mechanical Dentistry," Flagg's "Plastic and Plastic Operations," Arthur's "Prophylaxis and Treatment of Dental Decay," Hietsman's "Microscopical Morphology," Essig's "Dental Metallurgy," Seabury and Gilbert's "Vulcanite and Celluloid," and the compilation of Webb's articles on tooth filling, cohesive gold, and the electro magnetic mallet, are all works replete with information and instruction. But alas! it must in truth be said, all are more or less marked and stamped by the errors and imperfections incident to human efforts and human enterprises.

The works and authors I have named are representative of "American dentistry"—of modern and advanced American dentistry—*that* dentistry which, in simple truth, and without vanity, arrogance or egotism, may be said to have led, enlightened and elevated dental science throughout the civilized world.

It is now the fashion, and I may say the folly, in some quarters, to parade and make a sensation—or, as our Western friends would phrase it, "whoop up" the writings, researches and investigations of our transatlantic scientists and authors. Now, sir, while I most cheerfully bear testimony to the worth and value of many foreign workers in our common field, and place a high estimate upon all they

have accomplished—nay, more, while I ungrudgingly award them all the fame and distinction to which their talents and learning and labors entitle them; and while I claim to be neither partial on the one hand nor prejudiced on the other, I must be permitted to observe, that with the exception of physiology, microscopical and histological anatomy, and pathology, our brethren abroad have *not* measured up to, equaled, or rivaled the work of our American authors and writers to the “manor born.” And I make this declaration fearlessly, and in the face of my frank and cheerful acknowledgement of the high value and great worth of such works as have been produced by Tomes, Beale, Huxley, Nasmyth, Hunter, Fox, Bell, Magitott, Wedl, Lieher and Rotenstien, Kolliker, Kock, Bastian, Pasteur, and others which I have neither time nor space to enumerate.

Many of the old European and American standard works in our department of science, which illustrated talent and genius, and profound study and laborious research, and which were of value and commanding importance in their day and time, have been superseded—are now obsolete—and have been consigned to the “tomb of the Capulets,” along with the ephemeral and relatively worthless productions—foreign and domestic—of this latter half of the nineteenth century. In the catalogue I have submitted, I may have failed to include some works and authors of real merit and value, and if so, I shall be most happy to make the correction and the *amende*.

Of our journalistic and periodical literature, I am able to report not only a creditable and gratifying advance, but a supply equal to our growing demands and requirements. All over the land, from Baltimore, the birth-place and cradle of the first dental journal, to San Francisco, on the Pacific; from the Canada line to the Rio Grande, on our southern border, we have monthly or quarterly “journals,” teeming with the discourses, inventions, improvements and advances, fresh and fast, as they are being made in all the departments of our calling. The editorial conduct and original

contributions to our current literature demonstrate not only improved scholarship, but exhibit a deeper and broader range of thought, a more profound research, and a more laborious and thorough investigation of the subjects and problems that engage our interest and attention as progressive dentists, than has marked any previous era in our professional annals.

Many—very many—of the voluntary papers—the society essays, the committee reports, the transactions and discussions of our annual and monthly meetings, are of a character and quality that reflect dignity and honor upon our profession, and challenge the respect and admiration of our peers and co-workers in all the wide domain of general science.

While we frankly admit that there is in the material and make-up of many of our periodicals much that is amenable to just and sharp criticism, it is nevertheless true, that scattered along through a current volume, you will find articles, essays, and monographs that would honor and embellish the medical and surgical literature of this or any other country—articles and contributions that, in composition and purity of style, would do no discredit to "Blackwood," or the "British Quarterly." We lament the fact that a considerable percentage of our fellow-dentists, though they may be expert and skilful operators, lack the training and qualifications indispensable to finished and ready writing. However, we can yet point to a number, and that number is annually increasing, whose minds have been trained and disciplined, whose style has been cultured and refined, whose pens are dipped in *brain*, and whose productions, in mental grasp and vigor, in purity of taste and beauty of diction, place them alongside the acknowledged representatives of English and American letters.

The editorial revision and typographical execution of several of our leading periodicals and journals deserve our warmest praise and highest commendation; but, unfortunately, others exhibit a melancholy lack of care and attention

in these important regards, and so marred, and blurred, and blemished are their pages by false orthography, by incorrect punctuation, by the presence of utterly foreign and irrelevant terms and phrases, as to disgust some of the best writers in our ranks, and to confound and confuse even the professional reader, who is often compelled, as best he can, to *guess* at the real meaning and intent of his author's text. And I here take leave to say, that no one who assumes the duties and responsibilities of editor or publisher, has the moral right to neglect the careful scrutiny and correction of his "proof-sheets," or to travesty or make ridiculous the accepted work of his contributors, by placing that work before the public in a published form that should bring the blush of shame to the cheek of even a "printer's devil." Such neglect and delinquency is an outrage upon correspondents, contributors and subscribers; nay, more, it is a gross and shameful outrage upon a profession which these men claim to represent, and to which they appeal for maintenance and support. I do not wish, in such a report as I am now making, to be personal. I allude to this striking and capital defect in some of our current literature, in no spirit of hypercriticism, and with no disposition to be severely censorious, but in the trust and hope that this blot upon our professional journalism may no longer offend the sensibilities of our writers, or disgust the judgment and taste of our readers; in the trust and hope that our editors and publishers, if incompetent, or wilfully derelict, may have the grace to resign their positions, and transfer their duties to capable and competent successors.

In closing this part of my report, I feel that I shall perform a simple act of justice, and at the same time subserve the welfare of science and promote our own professional interests as dentists, by calling to your attention the high character and acknowledged ability of *The Southern Dental Journal*, published in Atlanta, Ga. This monthly journal especially commends itself to the consideration and esteem of Southern dentists by its energy and enterprise, by the

care and painstaking with which it is edited and published, and by the able and accomplished corps of writers and contributors it has engaged to fill and enrich its monthly issues. We sincerely think no Southern dentist can afford to do without this relatively local and truly meritorious monthly.

Upon the subject of "Dental Education," we have but few observations and suggestions to make at this time. The facilities and resources of the profession, so far as relates to training and education, would now seem to be ample and well-nigh complete. We have, as I have already shown, a full line of standard text-books in every division and department of our calling; we have an abundant, a helpful, and ever-fresh and instructive current literature, as I have also shown; we have yet the advantages of primary office instruction by private preceptors; we have independent and separate schools and colleges, and we now have dental departments in a number of the universities and medical colleges of the country—all officered and equipped full professors, adjunct and assistant professors, demonstrators, and a corps of clinical lecturers and instructors. We have in these institutions lecture halls, infirmaries, laboratories, and dissecting halls, with all the appointments and paraphernalia required in each. We have to overlook and supervise these schools of learning, trustees, boards of visitors, chancellors, and boards of regents. We have for each school, or "dental department," laws, rules and regulations for its conduct and general government, prescribing the terms and conditions of matriculation, the course of study, and the requirements for graduation and degrees.

Now if these terms and conditions are faithfully and honestly observed; if these laws, rules and regulations are enforced, and fairly carried out and executed by our Chancellors, Regents, Visitors and Faculties, what more can be reasonably asked or desired by our professional students or representative practitioners? The prescribed course of study and training is wide and comprehensive; the facilities and provisions—didactic and demonstrative—abundant and

complete; the standard for matriculation and graduation, under the recent *wise* and *timely* action of the Associated Faculties of Dental Colleges, is to be raised, and the lecture terms lengthened, and, I repeat, what more can the profession or the intending and most aspiring student for future membership in the profession, expect or desire? I see nothing to suggest except a faithful and conscientious observance and enforcement of these laws and rules, and the prompt and final abandonment of the mischievous absurdity of matriculating applicants for the lecture terms, who present but the single qualification of "*cash in hand*," to pay for tickets of admission.

With the sharp competition engendered by our superabundance of professional schools, and dental departments of other schools and universities, I know it is a hard thing for the Deans to turn away an illiterate ignoramus, who presents himself, with his pockets plethoric, and bloated with gold or greenbacks, and it was in anticipation of this and *other* evils, that I long ago placed myself on record as opposed to the multiplication of dental schools and colleges and dental departments in other schools. Years ago, if I may be permitted to quote myself, I told this body of Virginia dentists, and, through the press, the dentists of the entire country, that we were overstocking the market in the line of dental colleges; that the aphorism, "Competition was the life of trade," or the life of anything else, was a fallacy; that outside of given limits and conditions, competition was a blight and mildew and death. "Establish a dental college in every county and at every cross-road; make every fifth or tenth or twentieth man or woman a dentist (for they now take all comers, and make dentists of both sexes) and how long would the colleges or their students and graduates exist? We have at present in operation at least *four times* as many dental schools and colleges as are needed or demanded by any exigency or requirement of our educational interests, and all are making a struggle for patronage, for existence, and some of them for supremacy.

All want classes respectable at least in numbers, and the temptation to receive all applicants who can pay, is hard to withstand. I long ago tried, in my humble way, to quiet and restrain our restless and aspiring embryo teachers and professors, but they were ambitious; some said they were only "enterprising"—"the world moved;" and we have had the dental schools all over the land. Some have already perished, others are maintaining a feeble and sickly existence, and the end promises an illustration of the "Darwinian theory of the survival of the fittest."

But I am happy to say we have good and reliable institutions of learning for our students. We have competent, qualified and faithful instructors who are reasonably well sustained and compensated, under the circumstances; and we expect in the not distant future to see the errors and mistakes which have damaged our educational system work their correction and cure in that sure but slow and costly school of "trial and experience."

In concluding this paper, perhaps already too long, I will, Mr. President, submit one or two observations and suggestions—the first to practicing dentists, the second to teachers and professors, the faculties of our schools and colleges. To the private practitioner I would say, be careful how you encourage a young man to select and adopt dentistry as a profession, for relatively few men have the natural aptitude and endowments essential to success in any department of surgery, and especially "dental surgery." It is an unkindness, nay more, it is an outrage, personal and professional, to accept a student, take his money and encourage him to waste his time and exhaust the energies of his fresh young life in the hopeless attempt to master a science or profession for which he is unfitted by lack of natural talent or lack of preliminary cultivation and training. When, however, you have the opportunity and inclination to accept a student of capacity and promise, teach him faithfully and thoroughly; but as a rule, if you would do him the highest service in your power, send him to the

Infirmary and Laboratory of one of our best colleges. Very few dentists in practice, whatever may be their capacity to teach, have time to devote to private students.

And secondly, I would say to the faculties of our schools, teach thoroughly every department of your curriculum, raise and keep high your standard of graduation; teach not only dental science, but teach a *moral* and *ethical code* that will enable you to send from your halls not only qualified dentists, but truthful, honorable and accomplished gentlemen; for to such alone do we desire to commit the future destiny of "American Dentistry."—*Southern Dental Journal*.

ARTICLE II.

THE ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

The first meeting of the Session 1885-86 took place on the evening of November 12th, at the rooms of the Society, 30 Chambers street, Edinburgh, Mr. W. Bowman Macleod, L. D. S., Edinburgh, President, in the chair.

The President, in opening the Session, made a few remarks in acknowledgment of his election to the Presidential chair.

Mr. Wilson exhibited the upper models of two cases having relation to Dr. Edwards' paper.

In the first there were, on the right side, a central, a geminated lateral (two laterals,) and a canine, all temporary; on the left, a permanent central, with a lateral and a canine, both temporary. The central had succeeded a geminated tooth (central and lateral.)

In the second, the second premolar on the left side was represented by a rudimentary tooth whose crown was hemispherical. On the opposite side the temporary tooth was still in place.

Mr. Lipscomb made some observations upon a case of a gentleman, about forty years of age, who had called upon him, complaining of a nasty taste in his mouth, especially when he awoke in the morning. He had been troubled for about two years. He found that his health was suffering a good deal in consequence, and that he was getting weaker every day, this condition being, however, associated with comparatively no pain. He had consulted his doctor at intervals during the two years, but with no beneficial results. On examining his mouth, Mr. Lipscomb found his teeth in good order, but the upper left wisdom tooth missing. As the patient then stated that he did not think he had had a tooth extracted from that position, the cause of the trouble was very easily diagnosed, viz., that it was the discharge from a fissure in that region. A free incision was then made up to the alveolus, and plugged well with cotton wool saturated with a weak solution of carbolic acid. In a few days, the plug having been renewed, Mr. Lipscomb succeeded, after some considerable difficulty, in removing the tooth, the reasons of which difficulty would be very obvious to anyone examining the tooth, as the roots were largely exostosed, and there was the danger of breaking away the posterior wall of the superior maxilla to be borne in mind—a by no means impossible accident, considering the porous nature of the bone. The wound was dressed for a few days with solutions of chloride of zinc and carbolic acid alternately, and a tonic prescribed. He soon began to put on flesh and gain strength and has made a complete recovery.

Mr. Campbell said—About a year ago he extracted, after a good deal of trouble, an unerupted wisdom tooth, the details of which he thought worth mentioning in connection with Mr. Lipscomb's interesting case.

The patient, a lady aged 49, had suffered from neuralgia more or less severely, on the right side of her head and face, for five years. For two or three months before she came under his care her suffering had been great. She had consulted several medical men, but without relief. He (Mr.

Campbell) knew the lady's husband, who spoke to him casually about his wife's great suffering. He suggested an examination of her mouth, which proposal was acted upon, but the teeth appeared to be perfectly sound. He noticed, however, that the right upper wisdom tooth was missing, and from the fullness of the gum, did not seem to have been extracted. On enquiry, he found the patient had never had a tooth removed from the upper jaw. From the symptoms, and the appearance of the mouth in the region of the upper wisdom tooth, he came to the conclusion that this tooth was not erupted, and the probable cause of all the patient's suffering. After consultation with the family doctor, who happened to be an eminent surgeon, it was agreed to put her under chloroform, and examine the state of matters. This was done, and when the gum and alveolus had been cut through, the instrument came upon the enamel of the wisdom tooth. Feeling now fully assured of its presence, he proceeded to extract it, but never before experienced so much difficulty in removing a tooth from its socket. The tooth in front, and a part of the alveolus surrounding the wisdom tooth, which proved to be extremely dense, was removed, and even then it was with considerable difficulty that the tooth was at last extracted, it having to be literally gouged out. The tooth was slightly carious and considerably exostosed. The patient of course suffered a good deal for a week or two after the operation, but has since been quite free from pain.

The President then read the following paper, forwarded to him by Dr. H. H. Edwards, D. D. S., of Madrid, illustrated by nine drawings of models, and also a model of a supernumerary incisor carved in ivory :—

THE MISSING INCISORS IN MAN. WHICH ARE THEY?

Gentlemen—In presenting the accompanying drawings to your excellent Society, I will; with your indulgent permission, supplement them with short descriptions of the same; also, if not trespassing too much on your valuable

time—to say nothing of your patience—will endeavor, in as brief a manner as possible, to add a new argument to this highly interesting subject.

In the first place, allow me to publicly thank Mr. Wilson for having brought the subject to my notice, it being the publication of his able paper that set me thinking. Also, allow me to pay tribute to the courtesy of your present able President, for kindly arranging to bring my feeble effort before your society.

Description of Cases Presented.

No. 1 represents a mouth in which the six incisors evidently are intact. The canines were extracted when the patient was a youth, in order to correct an otherwise great inconvenience and deformity. The supernumerary teeth are those, one on either side of the median line. The one on the right side being a geminous tooth, the supernumerary half of which would naturally follow the central type.

No. 2. This case presents a supernumerary tooth erupted to the left of the median line, and extraordinarily well placed in the line of the arch. This tooth is, in all its appearances, a supernumerary tooth of the central type.

No. 3 is the model of a supernumerary tooth erupted to the right of the median line. This case is a common expression exhibited by supernumerary teeth, and requires no more mention than to say I believe it to follow the central type.

No. 4 presents a case which, with our present knowledge, we presume that the left side of the mouth is normal, but on the right side of the mouth there exists a space between the central incisor and the—as Prof. Turner puts it—pre-canine. This pre-canine evidently is a supernumerary tooth, small but partaking of both forms of central and canine; a sort of nondescript, which may or may not be a diminutive type of the, so put forward, missing outer-third incisor. But why—when, as in this case, there is a certain space left open—the lateral incisor is suppressed and this supernumerary tooth created, is a matter for discussion and investigation beyond my power

No. 5 is a somewhat similar case as the preceding one, with this exception, that the open space is between the lateral incisor and the canine on the right side of the mouth. In this case, the lateral incisor has erupted, and Nature seemed willing to leave space enough for the eruption of the outer-third incisor; but it was not forthcoming.

No. 6. This case is another exhibiting spaces left for the eruption of teeth, and the non-fulfilment of the same. This, if the centrals had been close together, would be a very common expression of the suppression of the lateral incisors. It is a question as to whether the spaces left between central incisors may or may not be intended by Nature for the eruption of teeth.

In No. 7 is exhibited an arrangement of the teeth, having the left lateral suppressed, and the canine well up to, and touching, the central incisor. I should also say that the right lateral incisor is suppressed; the pre-canine, though not clearly shown in the drawing, is the model it has the decided appearance of being—as in case 4—supernumerary.

No. 8 is a carved imitation in ivory of a specimen that came into my hands not long ago, having been extracted in order to clear the mouth for an artificial denture, and given me by the patient on account of its peculiarity. It is evidently a geminous lateral incisor. Here seems strong evidence in favor of the outer third incisor. I have never seen a similar tooth, and I believe it to be a rare and interesting specimen. In the original, a bristle can be passed into each pulp canal.

No. 9. It is but a few days since this case came to my notice, and I include it, as showing that the expression of No. 7 may appear on either side of the median line.

In cases Nos. 1 and 8 I have used the term "geminous tooth," and I believe I am right in doing so, though hardly in accordance with Prof. F. Flagg, Philadelphia Dental College., U. S. A. who says that "practically geminous teeth have but one pulp," and the cause of gemination is "abnormality of crown tissue." In case No. 1 it may be so, for we

cannot diagnose a tooth in the mouth as possessing one or two pulps; but in case No. 8, although the crowns were joined during the process of creation, the roots are distinct, and each one possesses its separate pulp canal. They are not "attached teeth," for "though *they* have separate pulps their roots are attached to each other by the intervening wall of their alveoli; bone and cementum not uniting." Neither are they "fused teeth," that phase being brought about by exostosis or mal-position; consequently I hold to my right of calling them "geminous teeth."

It is perhaps needless to say I have cross-examined each of these patients—who are all educated, intelligent people—one of them being the present Home Secretary—to find out if any extractions had been done when young, for, I am sorry to say, there are dentists in this country who, through ignorance, are liable to extract a permanent tooth for a temporary one; but they all affirm that no such extractions have taken place.

I must apologise for the few cases presented, but I have presented them by selection, so as to cover the majority of variations that have come under my notice, which are many and variable; indeed, Nature seems to "ring the changes" upon the arrangement of these supernumerary teeth in a prolific manner.

Supernumerary teeth are undoubtedly presented to us by the great law of inheritance, the principal forms of which law may be divided into continuous, interrupted, collateral, and atavic.

The appearance of these supernumerary teeth is, I believe, due to the law of atavism; but upon whose authority we have it that pre-historic man possessed six incisors I know not, unless it be that of the "Evolutionist." I believe there are many who do not believe in the theory of evolution, but I will leave that question for more experienced men than I to argue. One observation I will make, though. I suppose that atavic characteristics appearing with comparative frequency is an effort on the part of Nature to bring to our

notice forgotten facts—doubtless for our edification—though for our use is questionable. As in chemistry, our professors tell us that no matter what changes take place, no particle of matter is lost; so in Nature, to those who can read aright, no information is wanting, though seemingly lost, to instruct us in what existed pre-historically. She is full of signs and warnings, but there is a want of ability on the part of man to read her with sufficient intelligence.

There is an interesting article in the *Cosmos* for September, entitled, "Heredity and Development of the Teeth," by Dr. Alton Howard Thompson, which will bear careful reading. Although the "missing incisors in man" may or may not have been in his thoughts, I may be permitted to quote somewhat relating to that subject. He says, "The suppressive effects of disuse as affecting development of the teeth through heredity and variation are also to be noticed. In no class of organs are the inherited effects of variation due to the influence of changed conditions so marked as in teeth of man. Being thus susceptible to the effects of active employment or of neglect, they have, by the protracted operation of disuse weighing upon them and retarding their production for generations, become, as one of its effects, so defective and incomplete as to approach the condition of rudimentary organs. The active employment of an organ makes demand upon the nutritive powers for its growth and strength, which is responded to by increased nutrition and added strength by those powers; and use gives an impetus to transmission, which causes that organ to be well and strongly developed in the next generation. But disuse furnishes no stimulus to either nutrition or transmission, and the organ so affected is produced as tradition due to the stimulus of past generations, when it was in active employment, but owing to its disuse in recent generations, it is weak and ill-formed; it has not the necessary stimulus either for development or strength. Not only that, but an organ that has fallen into disuse and neglect becomes deleterious and injurious, and is, by a natural process of economy of growth,

deprived of nutrition, that it may be suppressed and aborted. The remains of many such organs linger in the organization of man as rudiments of former organs which served a useful purpose under different modes of life: but the conditions of life being changed by new environments, these organs became useless, then injurious, and were gradually suppressed by the law of economy of growth. Such organs the teeth of man are rapidly becoming. Indeed the wisdom teeth have already arrived at that stage in their career of suppression when they are little more than rudiments. They are never well organized, are often rudimentary in form, and often totally absent, either through failure to erupt or development. The wisdom tooth in the race is departing, and we are the contemporary witnesses of the act of its abolition as a useless organ. Will the second molar follow it in time, and when the other teeth in more or less regular succession? We do not know, we only speak of what we observe. But we do know that all the teeth are defective in form, and deficient in structure, in most of the individuals of the luxurious races of man."

He does not appear to have noticed particularly the suppression of the lateral incisors, but only mentions that of the third molars. I will refer to the third molars later on.

Dr. Thompson also quotes M. Topinard (anthropology), who says, "The most remote ancestors have their share in forming the individuals, as well as the immediate parents. In atavism, the reappearance of character is a matter of chance, or rather there are in the germ latent powers, which are awakened into activity by favorable influences."

Also, he quotes Dr. Norman W. Kingsley, who says, "It is a most wonderful subject for contemplation, that at some remote period in the history of our progenitors, when Nature departed from the normal type, to produce, say, a deformed lateral incisor, a twisted cuspid, or to suppress a lateral, or a third molar, that following down the line of descent we find precisely the same peculiarity appearing and reappearing in the same line; and, again, not in the line, but in different branches of the family."

Of course if we ask for a reason why Nature interferes with existing laws to present us with a past specimen of her handiwork, we shall get no satisfactory response. In answer to an article of mine recently published in the *Dental Practitioner*, U. S. A. Dr. Dwight Ingersole says, among other good things, "The reason why Nature permitted physical laws to interfere with the laws of the organic kingdom has been asked for a thousand times, but no satisfactory answer has ever been given, because there is no reason for anything that has been brought into existence, the action of law. Nature seems to be blind and deaf to reason, and is arbitrary in all her ways. A reason was never given for anything until man came endowed with reason, and since his advent has seemed to be perfectly contented in allowing him to manifest the little he has, in his own way." I may add that there is great truth in the foregoing, notwithstanding its terseness.

Well, then, if Nature stands aside and leaves us to reason these things out, being content only to present us with the enigma, our duty evidently is to stand in the breach *à l'outrance*.

The question before us concerns the incisor teeth, but if I may be allowed to make a short digression, I would like to say a word about the molars. How many molar teeth did pre-historic man possess? Our nearest kinsfolk, I presume, by the law of evolution—if accepted—are the Simiadæ, of which there are three families, namely:—1, Arctopithecini; 2, Platyrrhini; and 3, Catarrhini. Now, these worthy kinsfolk—begging the pardon of any susceptible gentleman present—though their incisors are same in number as our own, they somewhat differ with regard to the number of their pre-molars and molars. No 1 possesses 3 pre-molars and 2 molars; No. 2 possesses 3 pre-molars and 3 molars; No. 3 possesses 2 pre-molars and 3 molars, on either side, above and below. I mention this for the following reason:—Some ten years ago I extracted a tooth—supernumerary of course—from the mouth of a woman in the west of England that had the appearance partly of a bicuspid and partly of a mo-

lar, but very small. It had erupted buccally between the second and third molars on the right side of the upper jaw. As it is an undisputed fact that the third molar is being suppressed, and in everyday practice I see numbers that are little more than rudimentary, it may be that the third pre-molar has been suppressed. One case is not sufficient to prove anything, but if there are other gentlemen who have met with similar cases, I would like very much to know their opinion. Certainly it would strengthen materially the theory—if so be there is a theory—of the suppression of outer thirds, namely;—The third molar, the third pre-molar, and the third incisor. Whoever has noticed the jamming and difficult eruption of the lower third molars that so frequently takes place, must also have remarked a shortening of the jaw itself, at its posterior portion. The law of economy of growth will not admit of superfluous organs, or parts of organs; therefore, if the third molars are to be suppressed, the jaws will shorten in consequence; or if the jaws take the initiative, then the molars must be crowded out.

Now let us return to the incisors. If so be that pre-historic man possessed six incisors, the question is—which pair or pairs have been suppressed?

At the outset, I think it is of vital interest that the period of eruption of the supernumerary teeth should be carefully recorded. I have never been fortunate enough to see a supernumerary tooth during the process of eruption; it would doubtless be of use in ascertaining to which type it belonged, and serve as useful data, so that we might reasonably fix the succession in which it originally erupted. If, by the law of atavism, the suppressed tooth appears, its appearance, by the same great law, should take place in its original succession. We know that the central incisors erupt at the age of 6-8 years; the lateral incisors, 7-9 years; and the first bicuspid from 9-10 years. Therefore, if the supernumerary tooth be of the lateral type, it should erupt between the ages of 8-10 years; if, on the contrary, it be of the central type, according to the position in which we place it,

namely, as a suppressed *central*, it should erupt between 5 and 6 years of age; while, if a lateral following the central type, between the ages of 6 and 8 years.

I have no doubt that some gentlemen will take exception to my fixing a date for the eruption of supernumerary teeth, and may with fairness say, that if in form these teeth are erratic, their eruption may also be erratic, and therefore, cannot form a reliable basis.

And now for a "new departure." Since having my attention drawn to this subject by Mr. Wilson's paper, I have differed somewhat in my mind from his views, and am more inclined to look upon the supernumerary tooth as being a rudimentary *central*.

The incisors are the teeth of prehension, and the centrals naturally are the most prehensile; therefore, if suppression has taken place through disuse, I infer that the original centrals would be the first to disappear. That the present lateral incisors are *now* being suppressed is not denied. But why? Because the present centrals still find sufficient employment to warrant their continuance, whilst the laterals are becoming more and more superfluous. In about 25 per cent. of my patients, I find the central incisors separated, while the lateral incisors of 50 per cent. possess cutting edges inclining more towards the canine arc than following the central cutting line. As a curious coincidence, whether arising from observation or professional direction, the manufacturers of artificial teeth are making their lateral incisors every day more and more like unto the happy medium between centrals and canines, namely, with rounded corners; they profess to have made them from impressions taken from the natural teeth, and in practice, whether for pivoting or plate making, that is the class of tooth I mostly use. It may possibly be a peculiarity possessed by the Spaniards, but, as I say, I find a goodly percentage with spaces between the centrals, the centrals shall in comparison with the canines and molars, and the laterals possessing the intermediate form between centrals and canines, even to the labial longi-

tudinal ridge. The above observations being forced upon me daily, with an occasional supernumerary tooth or teeth in the medium line or space, as in cases Nos. 1, 2, and perhaps, 3, make me strongly inclined toward the idea, namely, the suppression of the original *centrals* from generations of disuse.

Of course this is only surmising, but I would present the idea, with a view of widening the field of vision. We know that a solution sought for is invariably found, provided we wish that particular solution to *be* found; if a man wants a particular cause in order to explain a particular lesion, he will generally adopt that one which appears right to him and work hard at his proofs, not deigning to accept any innovations. It is partly with the idea of aborting such a catastrophe that I have presented the possibility of the supernumerary tooth or teeth as being suppressed *centrals*.

If the idea—mind, I assert nothing—brings forth good fruit in the shape of a thoroughly useful discussion of the subject I shall be satisfied; often a dissenting voice will either clench the accepted idea, or it will set men thinking of other possibilities.

On such meagre evidence as we possess, it is the wildest folly to found a theory; all we can do is to collect facts that will enable the next generation to form a firm basis. Facts, gentlemen, facts! Let all collect, accumulate, and register them in such quantities, that when *we* are gone there may be no excuse for the coming physiologist to taunt us with idleness or indifference.

In conclusion, gentlemen, I would earnestly impress upon all professional men, especially those whose practice commands the care of children's teeth, as in dental hospitals, to watch the development of these supernumerary teeth, and to carefully record all such cases that come under their notice.

As the paper was one which required some amount of thought it was considered better to postpone the discussion upon it until the next meeting, by which time the paper would be in the hands of the members; and it was decided to have woodcuts made of seven of the more important illus-

trations for the better consideration and study of the cases in question.

The President then proposed that Dr. Edwards should be elected as a corresponding member of the Society, and that a vote of thanks should be accorded to him for his labour and trouble he had been to in order to bring the matter under their notice, both of which propositions were carried *nem. con.*; and the Secretary instructed to communicate the same to Dr. Edwards.—*London Dental Journal*.

ARTICLE III.

THE ARSENICAL TREATMENT OF TOOTH PULPS.

BY A. MORSMAN, M. D., D. D. S., IOWA CITY.

It is with considerable hesitancy that I approach the subject of pulp devitalization. There are many among you older in practice than I, to whom my words will come with the monotone of an oft-repeated story. It must be remembered, however, that error does not give way to a single assertion, but to repetition and reiteration of truths.

As long ago as 1868, Prof. Flagg inveighed against the accepted doctrines regarding the use of arsenic, but nothing seems to have come of it, and teachers and writers go on promulgating the same vague and timidity-inspiring ideas, throwing students into the profession to learn by long and tedious experience, how to use this remedy to confer the most good and the least suffering upon their patients. In looking over standard text-books, I am impressed with the belief that he who begins practice with no more knowledge of this operation than he can obtain from this source, will count his failures upon his fingers, and his successes upon his thumbs.

The preparation of root canals for filling, from its inception to its termination, is an exceedingly difficult thing to do well, and an operation requiring great delicacy of manipulation to accomplish the object sought with the least infliction of suffering. This latter consideration is of the greatest importance in attempting devitalization.

Pain is an element that enters largely into almost all our operations, and to those whose dental imperfections *should* induce them to seek our aid, it is an obstacle, and one that is increased by every pang that we inflict. It is an obstacle to our success, also, by presenting to us, instead of simple cavities, easily managed and giving the promise of great utility, complicated cases, delay induced requiring great skill, and promising a lesser reward for our labors.

Commercial arsenic, or arsenious acid, has been used since 1836 for devitalizing tooth pulps. It has been misused and abused, but for all that it has become the accepted means to this end, and the number of pulps destroyed in other ways is proportionately very small.

Arsenic is a caustic irritant, and as such acts upon the dental pulp—just how, I do not pretend to say, but I see no reason for assuming that it is very different from other caustics in mode of action, save as increased potency is a difference. None of the “fine spun” theories that have been advanced throw any light upon the subject, because none of them agree with known facts. One ingenious theory is that the arsenic, being an irritant, causes congestion, congestion strangulation, and the pulp sloughs at the apical foramen. That is a good theory when the facts bear it out, but they don’t very often, because only a small portion of pulps die in that way; most of them are obstinate enough to die piece-meal. There is a great temptation to bridge a chasm of ignorance with a theory. One fact is worth a dozen theories, and there are times when it is creditable to say “I don’t know.”

The preliminary treatment of pulps that are to be subjected to arsenical devitalization demands earnest consider-

ation. An application of arsenic to a tooth pulp in normal condition, if it has been properly made, will produce no pain, and will act with desirable promptitude, but just as there is deviation from normality in the pulp, so is deviation from comfort to the patient, and the action of the medicament is delayed. I wish to speak impressively, therefore, when I say arsenic should never be applied to a pulp that is congested, or inflamed, or that has ached during the preceding forty eight hours, without preliminary treatment. Ofcourse I do not mean the slight temporary ache that is produced by cold air or drinks. Indeed, that is to be looked upon rather as an indication of health than otherwise. Tooth-ache, when the pulp is living, is indicative, usually, of inflammation in one of its stages, of that organ, and this condition is greatly aggravated by arsenical application. Time and comfort are both gained by first relieving the present symptoms. If only the stage of congestion has been reached, a gentle stream of water thrown against the sides of the cavity will often be sufficient to relieve the pain, and a cotton stopping that will protect from atmospheric changes may be all that is necessary as an application. Filling the cavity with chalk or soda is often an effective remedy. *Usually*, more than this is required, especially if there have been nocturnal pains. We have a number of remedies to choose from—carbolic acid, creosote, oil cloves, oil cinnamon, oil peppermint, menthol, hydrate of chloral, chloroform, opium or its preparations, camphor, and others that I do not remember. I have never been so uniformly successful with anything as with carbolic acid, either full strength or diluted with one of the oils. Whatever remedy is used, it should be allowed to remain in the tooth for twenty-four hours, and, to be effective, must render the tooth painless during that time. If pulpitis exist, it must still be our aim to relieve pain, and to protect from thermal changes and pressure, but this is now much more difficult than in the preceding stages, and we may run the gamut of remedies before we accomplish our purpose. Aconite and morphia are standard remedies here, and the two

can be combined with most excellent results. Carbolic acid, creosote, and remedies of that class, are sometimes used with good effect, but it seems to me they are quite as frequently irritants. Rest and time are essential. Applications should not be changed oftener than every other day, unless there are exacerbations of severe pain.

Pulp ulcerations should be treated in the same manner, save that the stopping must not prevent the escape of pus. This is an unnecessary warning when cotton is used, but it is not so as to other temporary stoppings.

It should be borne in mind that a considerable degree of abnormality *may* exist without pain, and we are then dependent upon physical signs in making our diagnosis.

The usual methods of applying arsenic are as a paste and powder. The paste consists of arsenic, creosote, and morphine. The powder is the commercial arsenic. The paste is the most popular form, and I am at a lost to determine why, unless it is the too common reason that because the bell-wether jumped the fence, the other sheep followed. It is sticky, and requires considerable dexterity to place accurately where desired. The morphine I believe to be an entirely useless ingredient, because the arsenic and creosote act first, closing the absorbents so effectually that no morphine can be taken up. What surgeon desirous of introducing a remedy by absorption would first cauterize the surface? The creosote acts as a pain obtruder, but is no more effective than oil of cloves, and is much more unpleasant. I do not like creosote. In my hands it is not nearly so effective as a pain obtruder as carbolic acid, and is about on a par with the essential oils. I speak, of course, of *pure* wood creosote. The commercial article is fully half carbolic acid, and is therefore just that much better than a pure article. A solution of carbolic acid in oil of cloves, or cinnamon, makes a very effective and not unpleasant remedy. It should be almost equal parts. If an application as mild as creosote is desired, I would prefer oil of cloves as being more acceptable and equally efficient. The profession has unfortunately

fallen in the habit of creosoting everything in a way that is decidedly empirical. In using the paste, a small portion is taken upon the point of an instrument, or carried to the cavity upon a few fibres of cotton. The powder is used by moistening slightly a very small pellet of cotton in the obtunding solution, touching it lightly to the dry arsenic, and placing it in the cavity with piers. There is usually enough arsenic adheres to the cork of the bottle for several applications. Only a very small portion of the drug is required, (about one-twentieth grain,) and we use, as a matter of convenience simply, much more than is really necessary, and enough at times to be hurtful.

In regard to preparing a cavity for an arsenical application, I should make it a rule never to give pain. We should be satisfied to syringe with lukewarm water, and to lightly detach loose pieces of debris, leaving the excavating to be done when it can be done without pain. The walls of the cavity should never be broken down except when necessary to gain access. •

Having now placed the arsenic in position, our next care is to keep it there. In a cavity with four walls, neither of which impinges upon the gum, this is a very simple matter, bearing in mind, however, that the material used as a stopping must, while it keeps the medicine in the cavity, be sufficiently porous to permit the escape of gases formed by the decomposition of the pulp. This is essential, because patients often fail to keep appointments, and we are obliged to guard against their negligence as well as against incidental danger. Periostritis from decomposing pulp is a serious complication both to patient and operator. There need be no effort made to keep the saliva out of the cavity; the arsenic is but sparingly soluble, and its mechanical retention is all that is necessary. For this class of cavities, a cotton plug is the most efficient means we have. It can be moistened with sandarach if desired, but I do not consider it necessary, and rarely use it. All other cavities than these I have just mentioned require greater care to properly re-

tain the medicament. It will be readily recognized that if the arsenic escapes from a cavity, the margin of which impinges upon the gum, death of the tissue just in proportion to its invasion will follow, and to prevent this, especially in proximal cavities, is often very difficult. Adhering still to cotton as the best plug when applicable, it must be accurately adjusted while the cavity is *dry*, and while still in this condition saturated with a solution of sandarach or shellac. If the walls of the cavity are so badly broken down as to make the retention of the plug unlikely, and ligatures cannot be used to bind it in place, we are obliged to resort to other means, and oxychloride of zinc, gutta-percha, or zinc phosphate, can be used. But it must be remembered that they lack the element of porosity, and therefore need earlier removal. The two latter have another objectionable feature; it is exceedingly difficult to apply them without producing pressure upon the pulp, and pain as a concomitant. *Any application that produces pressure upon the pulp as evidenced by pain is faulty, and should be removed at once.* Attention to this will save your patients nights of agony. The oxychloride acts very nicely in such cases, and can be made to adhere to an almost flat surface if dry. Its use occasions some pain (momentary), which can be decreased by mixing it pretty stiff.

It becomes occasionally necessary to destroy a pulp that is not exposed by the cavity; in such a case, make the application as usual, but allow it to remain only twenty-four hours, when the pulp can be approached with little or no pain, and the arsenic applied directly.

Having now placed the arsenic in position, and taken proper precautions for its retention in the cavity, how long shall we allow it to remain? The teachings, both by text and precept, still continue to be that it is dangerous to permit arsenic to remain in a cavity longer than twenty-four, or at most, forty-eight hours. It is strange that this opinion still persists, in spite of the many opportunities every practitioner has had to demonstrate its falsity. Hundreds of

times I have made appointments, which for some reason have been broken, and the arsenic, which I designed to remove at that sitting, has remained in the cavity for weeks and months without harm. Others relate similar experiences. The following case occurred when I first commenced practice, and will serve as an illustration of the folly of such teaching :

I made an arsenical application for a lady patient, and appointed a time for her return. She didn't appear. The next day passed—uneasiness on my part—another and still another day, and no opportunity to remove what had now become a night-mare to me. The fifth day I could stand it no longer, and slipping a pair of forceps into my pocket, I went to the lady's residence, expecting nothing *less* than that my patient was in bed with a face swollen all out of shape. I was greatly relieved when she met me at the door. She had had company—couldn't come—would be down to my office that afternoon. That day she left town. *Three months* afterwards I removed that application, cleaned out the canals, filled the tooth, and all was well. She said she never had a tooth filled so easily in her life. It was a case of vicarious sacrifice. I was the fellow who suffered.

We have had several cases of deaths *ascribed* to arsenic used as a pulp devitalizer. One occurred not long since. How does this happen? Easy enough. The attending physician, unable, from obscurity or ignorance, to make a correct diagnosis of the case, charges it upon the arsenic, and the dentist who put the plug in the mouth, *who ought to know better*, and whose ignorance is directly chargeable to his preceptor, or Alma Mater, permits the charge to go unchallenged. Suppose, in a case of this kind, a suit for malpractice was brought on the ground that the arsenic had been left in the cavity a week or ten days. (We all do that occasionally, in spite of the books.) What chance of acquittal would the defendant have, if the teachings and opinions of the profession were cited to the average jurymen? In self-defense we ought to demand a change.

The dangers from causing the arsenic to remain in a cavity longer than the prescribed time are said to be, first, poisoning from absorption of the drug: second, periostitis, necrosis, etc., from its action through the apical foramen. Arsenic used as we use it *cannot be absorbed*. Acting primarily and immediately as a caustic, it destroys as far as it reaches, and absorption is impossible. It has been used for centuries in the form of Come's powder for cancer, and in the hands of quacks has been applied to every available portion of the human anatomy, and large growths eaten out by it. If arsenic be diluted or reduced by admixture with other substances until it no longer acts as an escharotic, or but weakly so, absorption is imminent; but I believe it to be without danger as long as it is destructive. Dr. Ringer says: "The absorption of arsenic can be effectually prevented if sufficient be employed to excite active inflammation, for inflamed tissue loses the power of absorption more or less completely. * * * If, through fear of poisoning too weak an application is employed, the most certain way is adopted of accomplishing what it is desired to avoid." Our arsenical preparations should, therefore, be at least one-sixth arsenic. The nerve paste, as it is commonly used, is one-fifth arsenic. Come's powder is one-half arsenic.

In answering the first charge I have partly answered the second. Considering the drug to be placed in a root canal where there is no pulp, it might pass through the foramen, and when there, would, of course, act upon the adjacent tissues; but if there is any portion of living pulp in the canal, and that is the only condition requiring its use, then it is effectually prevented from passing through, unless, in very unskillful hands, it is forced through.

The idea of danger being now set aside, we again ask: How long shall the first arsenical application remain in position to produce the best results? It is possible that the arsenic has spent itself in twenty-four hours, but my success seems greater when I prescribe a longer time. Whether that is due to a continued action of the drug, or is

simply the effect of time, I am still in doubt, but evidence seems to show that the arsenic does not lose its efficacy at once. It is likely that the breaking down of tissue permits the action of particles not already satisfied. Be that as it may, my practice is to leave the arsenic in position from one day to four *weeks*, according to the convenience of the patient, and the size, age, and temperament of the pulp, *governed, of course, by the considerations previously mentioned in this paper.* Expecting, if the latter time is allowed, that the pulp will have sloughed, and that it can be removed at the next sitting. Preferably, however, if my patient is entirely under my control, and I can be certain of the security of the application, I would allow one week to elapse before attempting any removal of pulp substance. If security of application is an uncertainty, and it is quite often so in proximal cavities, I would make a *preliminary* application for twenty-four hours, to enable me to remove sufficient debris, or pulp, if need be, to make the cavity retaining, and then allow nearly a week to intervene before the next sitting, when I would prepare the cavity, and cut out the bulbous portion of the pulp with a rose bur in the engine, touching lightly, however, that the pressure might not be communicated through the dead portion to that which was capable of giving pain. At this stage the pulp *may* be entirely dead, but my experience is, that such is not often the case, and I would deprecate any attempt at extirpation unless further time was impossible, or evidence of sloughing was conclusive. It is these premature attempts to remove pulps that have given our patients such a horror of this operation.

And now, the bulbous portion being removed, shall we make a second application of arsenic? In many cases it is not. The pulp will slough off anyhow. But we cannot foresee this result, and knowing that these fragments are sometimes very tenacious of life, it is better to make another application at once. And here again I should use the dry arsenic. Tannin in combination has been recommended, on the ground that it hardens the fibrils, and renders them easy of removal. I do not con-

sider hardness an advantage, and would much prefer that the remaining tissue would disintegrate, as it can then be easily wiped out with cotton on a broach. The erroneous belief that tissue devitalized by arsenic would not disintegrate, has been held. While arsenic is one of the most potent preservers of dead animal tissue, that which it destroys does not differ in this respect from that destroyed by any other escharotic.

How long, now, shall this second application remain? It is impossible to say just when the sloughing will occur—the conditions of age, temperament, vitality, etc., are so different. Young pulps are more easily affected than those that are older. The lower the patient stands in the scale of temperaments, the less vitality there is in these fragments, or fibrils, and the sooner they are thrown off.

Here the operator must use his judgment, but I see no reason why the application may not remain *in situ* until sloughing has taken place. There is now no difficulty whatever as to its retention, and the quantity can be even smaller than before. And now I would recommend moistening a fine instrument—dipping it into the dry powder, and thus carrying it directly into the root canals. In inaccessible cavities this is impossible, and resort must be again had to the pellet of cotton, unless it is determined to make an accessible entrance to the pulp cavity, which is by far the best plan. The cavity proper can then be filled at once, and further operations conducted through the artificial opening.

I should not expect sloughing to take place in the average case in less than three weeks from date of first application, and should make an appointment at that time, or as nearly as might be convenient. In the majority of cases, extirpation can now be performed painlessly. If this cannot be done, and manipulation causes suffering, more time is required, and possibly more arsenic, although this is very rarely necessary where the drug has been kept in position the time specified. I usually fill the canals with carbolic acid, and the cavity with loose cotton, permitting the patient

to change it when desired, postponing the operation for such time as may seem best, but counting rather in weeks than in days, for nature always works slowly. In diagnosing, life still existing in the root filaments, we must be on our guard against deception by spurious pulp pains. This is caused by pressing the dead pulp, debris, or anything that is in the canal, against the unhealed continuation of the nerve exterior to the apex of the root. To differentiate, use a very fine probe—the finer the better—with a sharp point, and introduce it slowly and carefully along the side of the canal. If the pulp is dead, it will go to the apex without producing pain.

Tapping, as a means of ascertaining the condition of the periosteum, is delusive when a tooth has been under arsenical treatment. All dying pulps give pain upon tapping the tooth. So do those undergoing the later inflammatory stages. A symptom due most likely from periostitis from continuity. It is nothing of moment, and needs no treatment. One noticeable point about this symptom in devitalizing is, that it occurs only at the last stages—may it not be in a measure indicative of sloughing?

I have now only to say a few words about partly formed and temporary teeth. The above practice must be considerably modified in both cases. The same conditions exist in both of these classes of teeth, namely, enlarged apical foramen. We must be on our guard, therefore, against greater ease of forcing the medicament through.

The rule to save all pulps alive, whenever possible is never so pertinent as in the treatment of these teeth, because in permanent teeth partly formed, further growth ceases on death of pulp, that being pulp function. The root of pulpless temporary teeth cannot be absorbed, and may create disfigurement.

It is not necessary to allow so much time in these cases for arsenical action. In temporary teeth, twenty-four hours is long enough, and one application likely to be sufficient. For young children, I would prefer to use frequent applications of carbolic acid or tincture of iron.—*Southern Dental Journal*.

ARTICLE IV.

RIGHT AND LEFT-HANDEDNESS.

Dr. Chudleigh, in the *British Medical Journal*, writes as follows :

The functional asymmetry which makes one hand stronger than the other must have some anatomical basis which ought to be discoverable ; but no one yet seems to have detected the cause. Many a time have I gone over the unilateral structures of the body, to consider if any one of them was calculated to influence its own side for good or evil ; but I was always accompanied in my search by this baffling forethought, that if I did succeed in finding some cause for a general excess of muscular nutrition in the right limbs, there would be a corresponding excess of nervous nutrition in the right side of the brain ; an advantage which, by the decussation of fibres, would be transferred to the left side of the body, and things would be equal again. Yet, in spite of this difficulty, I have been continually haunted by the idea that it is in the innominate artery, if anywhere, that we are to find the solution of the mystery. The innominate secures for its own subclavian and carotid these advantages over the subclavian and carotid which arise direct from the aorta on the other side. A tube of a given calibre is more effective than two tubes of half that calibre ; therefore the innominate, besides serving as a kind of funnel-mouth to catch the stream, is a more effective channel than the subclavian and carotid together would be if arising from the aorta as two distinct tubes.

Again, the innominate lies rather more in a direct line with the aorta than do the two equivalent vessels on the other side ; wherefore the innominate would have the advantage of lying more directly in the set of the stream.

And the advantage of being a little nearer the heart, even if infinitesimal, is on the same side. Thus the "bend sinister" of the aorta, and the existence of the innominate artery, tend to increase the blood-supply of the arm and brain on the right side. This fairly accounts for a slight excess of muscular nutrition in the right arm; and a slight excess, by provoking use, would induce further development. But the right carotid has the same advantage as the subclavian; how is it, then, that equilibrium is not restored by an excess of nerve-force being sent across to the left of the body from the right of the brain? When we observe that ponderous muscular power can co-exist with a comparatively small brain, as in the elephant and boa, whereas a large brain with small muscle by no means implies muscular power, it seems fair to conclude that an increase of muscle produces more physical effect than an equal increase of nerve-matter, and that consequently the advantages of the innominate tell more on the muscle of the right arm than on the nerves of the left side of the body. But this only accounts for the superiority of the right arm; what can be said about the remainder of the right side? In the first place, not all the right side is superior to the left; next to the arm, it is mainly in the leg that "dexterity" is discernible. In the next place, the superiority of the right leg is not nearly so marked as that of the right arm, and may be due to the fact that a sense of power in the right arm inspires a sense of confidence in all else that is right, whence results more frequent use, and consequent development. Also the advance of the right arm often necessitates the advance of the right foot, as in sword-exercise. But in numerous other cases the left leg, if left to itself, displays a degree of forwardness which excites a suspicion that its inequality is not natural, but induced. I have asked a considerable number of the London Shoe-brigade which foot their customers usually present first, and the replies have been that the left is first presented almost invariably.

The foregoing theory can be easily tested in several

ways. Abnormal cases are occasionally noted where there is no innominate artery, the right subclavian and carotid arising directly from the aorta, like their fellows on the other side. I think that one or more such irregularities were observed last year in the dissecting-room of University College, Liverpool. It would be interesting to learn if there were a history of left-handedness in any of those subjects. Also it sometimes happens that the normal position of viscera is reversed, and all the organs are found to have changed sides. One such case is preserved in the College of Surgeons, and within the last few months another was reported from America. Is it possible to ascertain if left-handedness was observed in either of these?

Some of the facts connected with right and left are curious and interesting. If one offer the right hand to an European adult, the propensity to extend the right hand in return is so strong as to be almost a reflex action. A Bokhara sheik, who suspected Wolff of being a Frank, applied the test of offering him his hand; fortunately for himself, Wolff did not grasp the hand, but responded with a salaam in correct Oriental fashion. But in children, this propensity is either not yet developed, or else is overcome by an innate law of least action. I have tried the experiment of offering my right hand to scores of little children; they invariably give the left, which is nearest, and do not cross the right hand over. If I offer my left, they return the right, again swayed by a law of least action. In sliding on ice, my schoolfellows used to put the right foot forward almost invariably. Though the word Benjamin means Son of a Right Hand, yet the tribe seems to have been notoriously left-handed. The name may have been euphemistic, like Euonumos and Aristera. Von Miklucho Maclay says that Papuans are always left-handed. I should very much like to know something about the Papuan innominate.

LIBRARY
ARTICLE V.EXSECTION OF INFERIOR DENTAL NERVE;
FOR RELIEF OF PAROXYSMS IN
LOWER JAW.

BY L. P. DOTTERE, D. D. S., OF SOUTH CAROLINA.

(Read before the Charleston Dental Association.)

HISTORY.—Patient, sixty-four, having lost all her teeth in trying to gain relief; but since removal of the last, which was about eight years ago, pain has been augmented, though intermittent; since she would have a few months' relief, and then as many in bed, suffering intensely every few minutes with paroxysmal pains, located in the jaw between the position of second bicuspid and median line. Her lower lip on affected side was also troubled, and the act of swallowing or pressure upon the jaw would bring on a paroxysm. Nourishment had to be of a lukewarm temperature, and any thermal change would aggravate the pain. Her attending physician called me in consultation, and after a thorough examination, diagnosed the inferior dental nerve as being stretched, or having a bulbous formation.

Knowing the patient to be averse to an operation, advised a hard rubber capping, to extend all around the jaw, and the wearing under this of a layer of bibulous paper saturated with cocaine.

This relieved her somewhat, and assisted in swallowing but did not stop paroxysms, which continued nearly as intense, especially early in the morning.

After testing this treatment, advised the operation which is the subject of this paper.

The patient being chloroformed, an incision was made from the position of the second molar to bicuspid along the

lingual border of the bone, then another transversely towards the cheek. The integument was then pressed back, exposing the upper surface of the bone.

Through this was made two parallel cuts with a circular saw, guarded by a shield, and worked by the dental engine. Next, the ends of these cuts were joined by a fissure drill, and the block of bone removed, exposing the canal. The nerve was then raised with a hooked excavator, and cut in two places, taking away about a quarter of an inch.

The edges of the bone were then rounded with a large bur, parts well syringed with tepid water, and the flesh wound stitched; but before the patient became conscious, we injected into the canal about twenty drops of cocaine, to relieve after pain.

Next day patient complained of a throbbing and knitting sensation, but wound showed no signs of sloughing. In one week the stitches were removed, and in two weeks wound had healed by resolution.

Dr. C. B. Lannear ably assisted in the operation, which was performed five weeks ago, and since, there has not been a paroxysm; though she still feels at intervals a gnawing sensation, which no doubt is caused by nature in bridging over the canal.—*Southern Dental Journal*.

NINTH INTERNATIONAL MEDICAL CONGRESS.

SECTION ON DENTAL AND ORAL SURGERY.

As there seems to be some misapprehension in the minds of some, and earnest inquiry by others, as to the status of the Section on Dental and Oral Surgery, in the International Medical Congress, to be held in Washington, D. C., in 1887, it seems right and proper that some statement be now made in regard to the organization and progress of the work.

It is very generally known that the Section has been

established and organized ; the following officers have been appointed, viz : a President, one Vice-President, and two Secretaries.

Fourteen gentlemen of recognized ability and high professional standing, from various parts of the country have accepted positions upon the Council, and have pledged themselves to do all they can to make this Section a success. At the next meeting of the Executive Committee, ten or twelve more names will be added to the Council, as may seem best. Much of the preliminary work in arranging the matters of the Section, has been in the main accomplished.

A programme—embracing the subjects of greatest interest to the profession of the world—has been outlined, and is now under consideration ; and as soon as completed, the secretaries will open correspondence with the eminent men of the profession in Europe and America, relative to the work to be done. Quite a number have already indicated a desire to prepare papers, or at least take some part in the work.

We not only expect, but are assured, that this Section will receive the hearty support and co-operation of dental specialists, both at home and abroad ; and with such manifestations, great hope is entertained that the Section will be eminently successful. We ask for it the co-operation of all who have the best interests of our profession at heart.

A circular will ere long be issued by the Executive Committee, giving the status of the preparatory work for the Congress.

J. TAFT,

President of Section D. O. S.

UNIVERSITY OF CALIFORNIA.

The fourth annual commencement exercises of the College of Dentistry, of the University of California, were held in connection with those of the Medical Department, at the Grand Opera House, San Francisco, on Tuesday, November 10th, 1885, at 2 o'clock.

Address on behalf of the dental department was delivered by Prof. Maurice J. Sullivan, D. D. S.

The degree of Doctor of Dental Surgery was conferred upon the following graduates:

Harry Sylvester Betts, George Boltsford, Daniel Barratt Cate, Nathaniel Thomas Coulson, George Ihnier Drucker, William Ellis Fitzpatrick, Walter Robert Henderson, John Adams Douglass Hutton, Franklin Pancoast, Charles Theodore Rodolph, Frederick Judson Saxe, A. M., Joseph Schneider, Henry Sylvester, Jr.

Editorial, Etc.

THE ANNUAL COMMENCEMENT OF THE UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT, will be held in the Academy of Music, Baltimore, on Wednesday, March 17th, 1886. Although the graduating class will be smaller in number than those of previous years, yet the number of matriculates during the present session of 1885-86, is larger than ever before. A strict compliance with the resolution adopted by the "Association of State Dental Examiners," and the "American Dental Association," in regard to the requirement of *two full sessions of five months each before graduation*, is the cause of a smaller graduating class this year than usual, as no less than *twenty-two* applicants for graduation after one session's attendance and five and more years of practice, were refused; otherwise the graduating class of the present session would have been larger than those of other years, instead of smaller.

In the graduating class of the year 1885, no less than 17 were one session students, who were admitted to the senior class on five and more years of dental practice, which heretofore has been regarded as equivalent to one session's attendance. The University of Maryland Dental Department is endeavoring to maintain the highest standard of dental education

possible and will always be found ready to second the efforts of State Dental Examining Boards and Dental Associations in advancing the requirements for graduation to a proper grade. And although over twenty applicants have this session been refused graduation, yet in the end the Faculty are satisfied that their efforts in this direction will be appreciated by the profession. The fact that this Department has had during the present session of 1885-86 its largest class of students, is proof positive of its reputation as a dental school. Hence the sacrifice was willingly made in order to comply with the requirements for graduation as adopted by the several Associations. The question may also be asked: "How many of the Colleges belonging to the Association of Dental Faculties have followed the example of the University of Maryland Dental Department during the present session of 1885-86. in regard to the *two sessions rule*?"

The printed proceedings of the Association of Dental Faculties plainly show that this rule of two sessions was to go into effect in June, 1885, and that all members of said association had obligated themselves to conform to it. How it can be construed to apply to future sessions and not to the present ones is beyond comprehension, if the printed proceedings of the meetings are correct. However, there is no question concerning the strict compliance with said rule on the part of the University of Maryland.

DR. OLIVER WENDELL HOLMES TOAST AT THE DINNER OF THE NEW YORK ODONTOLOGICAL SOCIETY—In declining an invitation to dine with the New York Odontological Society last week Oliver Wendell Holmes wrote: "I often think of the forlorn condition of some of the great personages of history in the days when there were no dentists, or none who would be recognized as such by the dental artists of to-day. Think of poor King David, a worn-out man at 70, probably without teeth, and certainly without spectacles. Think of poor George Washington, his teeth always ready to drop like a portcullis, and cut a sentence in two. See him in Stuart's admirable portrait, his thoughts evidently divided between the cares of em-

pire and the maintenance of the status quo of his terrific dental arrangements. Think of Walter Savage Landor's melancholy complaint that he did not mind losing his intellectual faculties, but the loss of his teeth he felt to be a very great calamity.

"I will venture to propose, then, the dental profession and their association as its worthy representative: It has established and prolonged the reign of beauty; it has added to the charms of social intercourse and lent perfection to the accents of eloquence; it has taken from old age its most unwelcome feature and has lengthened enjoyable human life far beyond the limit of years when the toothless and purblind patriarch might well exclaim: 'I have no pleasure in them.'"

OPPOSING BALTIMORE MEDICAL COLLEGES.—CORRECTION.—Under this title a communication appears in January No., 1886, of the *Dental Cosmos* written by the *Correspondent of Baltimore Times*, from which it is copied, to the effect that the State law of Pennsylvania demands that all medical students who graduate outside of the State shall have their diplomas indorsed by some recognized school in the State. It further states that "heretofore both Jefferson College and the University of Pennsylvania have indorsed such diplomas, Jefferson College only making exception in cases of irregular or bad schools." "But in order to more fully comply with the State law the University of Pennsylvania will hereafter demand that all students who want their diplomas indorsed must stand an examination before the faculty, and for such an examination pay \$30."

As this statement might be understood as applying to the diploma of the University of Maryland, School of Medicine, it is only necessary to state that a letter recently received by Professor Wm. T. Howard, M. D., from Professor Roberts Bartholow, M. D., of Jefferson Medical College, Philadelphia, asserts that the diploma of the University of Maryland, School of Medicine, Baltimore, *will be indorsed* by Jefferson Medical College.

It will therefore be seen that the proposed action does not apply to the diploma of the University of Maryland, School of Medicine, which has always maintained a high and unquestionable reputation.

Bibliographical.

RECOMMENDATIONS OF PROFESSOR GORGAS' WORKS.—

From the Independent Practitioner, Dr. W. Barrett, Editor.

—"In the last volume of this journal we received the first edition of this work, and now we are called upon to notice the second. It is a very unusual event in the history of any medical book, when the second edition is so soon called for. When the first appeared we predicted that it would meet with favor, and the unusual sales have verified the not very hazardous forecast. The second edition is a considerable improvement upon the first. Sixty-eight pages have been added, and the whole text revised. Short as has been the time since the first edition, there were already a number of new remedies offered to the profession, all of which, we believe have received due notice. Gorgas' Dental Medicine has already taken its place near the head of our professional literature. It has, we believe, no equal in the English language, if in any other, as a text-book on dental medicine, and we shall look to see it adopted in all countries, where there is dental teaching, as the standard work on dental Materia Medica and Therapeutics."

From the Dental Cosmos, Dr. Jas. W. White, Editor.

"The sale within less than two years of the first edition of this volume is an indication of the need which existed for such a manual. The work has been entirely revised, and many valuable additions made to it, including a chapter on inflammation with special reference to the mucous membranes of the mouth. All the new agents used in dental practice have received notice, and the book gives evidence of conscientious, painstaking labor on the part of the author. An index to diseases and dental formulary has been added, facilitating easy reference to patho-

logical condition and remedial indications. Additions have also been made to the dental formulæ with fuller explanations of the methods of prominent practitioners for the special employment of medicinal agents and the results of recent investigations into the properties of anæsthetic agents. The volume as a whole commends itself as an educator and as a work of reference which should be in the hands of every student and every practitioner of dentistry."

From the Southern Dental Journal, Dr. B. H. Catching, Editor.

"Second Edition, Revised and Improved of Gorgas Dental Medicine. Only a few months ago we had the pleasure of calling attention to the first edition of this valuable work. Its merits we highly appreciated and spoke of. Even under the most favorable criticisms and circumstances, we did not think that so soon would we be called upon again to present its great merits in an enlarged and revised second edition. While the large sale of this work is pleasing to both author and publisher, it is no less so to this journal, as an indication of the demands of the dentists in these important branches of dental science. Truly a healthy sign. The second edition contains sixty-eight additional pages, etc., etc."

From "The Dental Eclectic," S. S. Willard, D. D. S. Editor.

"The first edition of this most excellent and indispensable work was issued not quite two years ago, and the fact that it has already reached its second edition is in itself a sufficient guarantee of its popularity and value to the profession. Up to the date of issue of Dr. Gorgas' work the dental profession had suffered from a scarcity of works of this character, and its members were compelled to look to works on general *Materia Medica* and *Therapeutics* for their needs. Dr. J. W. White published a small work on the subject in 1868, and about this time or later, one was issued in London by Dr. J. Stocken and Thomas Geddes. There is a marked improvement in the second edition. The whole work has been entirely revised and sixty-eight pages added to the volume. Among the added chapters are admirable ones on "Inflammation with special

reference to the Mucous Membrane of the Mouth," etc., etc., etc. An interesting and valuable portion of the work is that containing a diagnosis and synopsis of treatment of mouth affections, etc., etc., etc. The volume shows careful work throughout, and a thorough knowledge of the subjects treated. It has already gained a place in the front rank of dental literature, and no dental office or library is complete without this standard work on Dental Materia Medica and Therapeutics."

*From The Dental Advertiser, Theodore G. Lewis, D. D. S.,
Editor.*

"The necessity for a second edition of Gorgas' Dental Medicine is gratifying evidence of the estimation in which the work is held by the profession. We have found the first edition of inestimable value, and have had occasion to refer to it more frequently than to any other work in our possession, and always with gratifying results. The present edition has been thoroughly revised and from the author's preface we learn that among the additions are, etc., etc., etc., making the most complete work on dental medicine ever published."

*From The Dental Practitioner, Chas. E. Pike, D. D. S., and
L. Ashley Faught, D. D. S., Editors.*

"Gorgas' Dental Medicine—The author of this work having already given to the profession of dentistry "Harris' Principles and Practice of Dentistry," and "Harris' Dictionary of Medical Terminology and Dental Surgery," now by its production closes up an important gap in all dental libraries. The want has long been felt, by not a few, of a work which shall deal with the medicines used in dentistry from a purely dental standpoint; and yet be sufficiently comprehensive in its construction to embrace enough general, practical information to enable a practitioner to use his drugs with confidence and power. We believe that the work of Dr. Gorgas, as it comes to us in this second edition, very largely accomplishes this object, and feel that no dentist or dental student can afford to be without one, etc., etc., etc."

CONCERNING DR. GORGAS' "SERIES OF QUESTIONS FOR DENTAL STUDENTS."—*From Dental Cosmos*.—"The object of this work is to facilitate the study of dental science and its collaterals and comprises leading questions on all the branches belonging to the course of study pursued by the dental student, —embracing dental histology, dental pathology, dental surgery, dental prosthesis, dental materia medica and therapeutics, general anatomy, physiology, chemistry,—organic and inorganic, —and metallurgy. The questions in these different departments seem to have been in the main well chosen, and correct answers to them would indicate a very respectable familiarity with the several subjects. No student who finds himself able to answer the questions therein contained need doubt his ability to pass a satisfactory examination; and there are not many practitioners who would not be benefitted by the mental effort and by the research needed to enable them to give replies satisfactory to themselves to these interrogatories."

From The Southern Dental Journal.

"Prof. Gorgas' fertile brain is ever at work to give to dentistry a substantial aid in its standard literature. This work is similar to one issued several years ago on dental science, which proved very valuable to students, yet its field is much broader, covering the entire curriculum of the student. Sometimes it is easier to ask than to answer questions—at least the student thinks so, and to him this book is of great importance, as he will be led through the whole course of instruction, and can easily find when he is deficient."

From The Archives of Dentistry, Dr. C. W. Spalding, Editor.

"This work is a valuable guide to the dental student, and points out what he should learn, hence will save a great deal of valuable time. The "Quiz" has become an indispensable part of the course in all colleges."

From The Dental Practitioner.

"This work, as the preface states: "comprises leading questions on all the branches belonging to the course of study

pursued by the dental student and its object is to facilitate the study of Dental Science and its collateral branches." A careful examination of the book will show that if it fails to accomplish the object for which it has been prepared it will only be for the reason that it is not fully appreciated by the profession. It comes from the pen of a well known author and fills a want long felt by many dentists. While of value to the student of any College of Dentistry, it will have increased value to the professional student in active practice. It is a splendid plan of study for the young and old practitioner. We are sure that if every dentist would faithfully work out the answers and their suggestive line of study limitedly, that in a short period greater unanimity of knowledge in answering the questions of patients would exist in all communities."

From The Independent Practitioner.

"For the dental student such a work is invaluable. It not only gives proper direction to his duties, but it teaches him conciseness and preciseness. In preparing for examination it becomes an essential. Nor is it alone the student who will find it of value. The practitioner, who would retain in his memory the teachings of his College days, and who would keep abreast the march of progress, would do well to take up a chapter occasionally, and ask of himself the questions which it contains. If he be not at times astonished that he should have forgotten so much, shocked at his own ignorance, and thereby spurred on to a renewed application to his text-books, his experience will be different from that of most men.

The many years which Prof. Gorgas has spent as a teacher in our dental colleges especially qualifies him for the preparation of such a work as this. Nor is it the training of experience alone that he brings to the task. He has the broad views, the general culture, and the discriminating mind that are so necessary to the successful teacher, and all these qualities are amply exhibited in this excellent series of questions, which covers almost the whole field of dental research."

Dr. Richard Grady, Secretary of the "Maryland State Board of Dental Examiners," writes as follows concerning this

work: "The book cannot be recommended too highly. To those engaged as students or teachers of dentistry, it is almost indispensable, and to those who are not, but simply practitioners a perusal of it will be profitable. Your position as a teacher of many years experience has rendered you familiar with nearly all that is best worth knowing in Dental Science, and your extensive observation and well-earned reputation in practice makes you a competent judge as to what is best suited for the requirements of dental students; as would therefore be expected from one whose works already stand high in the estimation of the profession, your work is essentially a practical one. The first "Questions on Dental Science" were so favorably received that it is hardly necessary to speak for "Series of Questions for the Dental Student," the universal welcome of which they are so deserving."

Of the 11th edition of the "Principles and Practice of Dentistry," Dr. J. N. Farrar, of New York, writes as follows: "I have just been reading your new work, "Principles and Practice of Dentistry," &c., and I must say it is the best and most scholarly work that I have read from any American author on dentistry."

Dr. George Watt, editor of the *Ohio State Journal of Dental Science*, writes as follows concerning the eleventh edition of the "Principles and Practice of Dentistry." "This splendid book is undoubtedly *the* work on modern dental practice and reflects great credit on its editor—we are tempted to say author, for it is virtually a new work by Prof. Gorgas." "We have carefully examined the thousand pages and find little or nothing in them to criticise." "Every reader of the *Journal* should own a copy for reference, if not for study."

TABULAE ANATOMICAL OSTEOLOGIAE.—*By Carolo H. von Klein, A. M., M. D., Cincinnati, Ohio.*—This useful Anatomical Hand-Atlas is presented in Latin and at a trifle as to cost, in order, as the author states in his preface, that the work may reach every physician, surgeon, dentist and medical stu-

dent in the civilized world. The merits of this Anatomical Atlas are such as to commend it to all interested in the study of anatomy, and it cannot fail to be of the greatest service to the student of anatomy on account of the admirable manner in which it is arranged and the finely executed engravings by which it is illustrated. Anatomical works of recent years may be said never to grow old, but the difference in the style and arrangement of such treatises commend some over others as more comprehensive text-books. We consider the work of Dr. Klein to be a great improvement over many others of a like subject.

VICK'S FLORAL GUIDE FOR 1886.—The Illustrated Holliday number is by far the handsomest of these annuals yet issued by the reliable and widely known house of James Vick, Rochester, New York. This number contains 160 pages profusely illustrated with the addition of two finely executed full page chromo lithographs. Besides the descriptive catalogues, which are very complete, over thirty pages are devoted to instruction in horticulture and familiar talks, which render the volume both interesting and useful.

Monthly Summary.

EXTRAORDINARY EFFECTS OF DRUGS.—At the recent meeting of the French Association for the advancement of Sciences, M. M. Bourru and Burot reported some remarkable experiments on two hystero-epileptics. With these subjects, an action is produced by any medicine wrapped in paper or even enclosed in a corked bottle and held at a distance of several centimeters from the body of the subject, without his knowledge and while he is in the waking state. At first are obtained the ordinary actions of irritation or inhibition; then very

soon there is displayed a picture always the same for the same drug. This includes both psychical and physical phenomena, the last being the more prominent. Iodide of potash makes them sneeze and yawn. Opium puts them into a deep sleep, from which it is difficult to awaken them. Chloral produces a light sleep. Ethylic alcohol produces a happy intoxication, while methylic alcohol makes them furious. Ipecac causes vomiting. Scammony produces intestinal contractions. Cherry-laurel water produced, in one case, religious ecstasy followed by thoracic convulsions. Valerian gave with both subjects phenomena analogous to those which it develops in cats. Cantharides caused priapism and burning sensations in the urinary tract. Phosphorus caused trembling. Veratrine caused snuffling, itching of the nose and disturbance of vision.

Professor Duplong, who assisted at most of these experiments, affirmed the authenticity of the above report. He stated that the number of subjects capable of presenting the phenomena was very limited. Only two were found in Charcot's service, and none were found in the hospital at Grenoble. —*L'Union Medicale.*

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ARTICLE I.

ODONTO-CHIRURGICAL SOCIETY.

At the December meeting of this Society, which took place in the Society's Rooms, Edinburgh, Mr. W. Bowman Macleod, President, in the chair, the discussion upon Dr. H. H. Edwards' paper, on the "Missing Incisors in Man" was opened by Mr. Wilson, who said he had listened to the reading of the paper with much pleasure, and he was very much pleased to learn that the short paper he had read to the Society in March had had the effect of bringing into the field such a close observer and skillful artist as Dr. Edwards.

Case 1 shows a state of the incisors he had never seen in the permanent series, and but twice in the temporary. He differed from Dr. Edwards in that he considered the extra teeth to be not the central pair, but the first lateral, although these are remarkable as being larger than the central; one thing certain was that it was not the second, or outermost lateral pair.

Cases 2 and 3 represent cases with which most present were familiar.

In Case 4 he did not see any ground for calling the incisor in relation to the right canine anything but a dwarfed normal lateral, difference of form in the pair of these teeth being not unfrequent, and the space between it and the central was not so large as to require accounting for.

In Case 5 the space occupies the line of the maxillo-premaxillary suture, and it is more likely to be connected with the development of the bones than with the teeth.

Case 6 was, in his experience, a common form when the laterals were suppressed.

In Case 7 the incisor between central and canine on the right side he regarded as a dwarfed normal lateral, and case 9 only differed from it in that the lateral is more rudimentary in form. In the majority of similar cases which had come under his own notice, the solitary lateral was conoid.

Case 8. The tooth so beautifully reproduced in ivory he did not consider a germinated tooth at all, but what was much rarer, a double-rooted lateral, the extra root being due to the malformation of the cingulum, the two sides of which had not united, the small root being a continuation of the distal half.

Laterals were extremely liable to have the cingulum malformed, but it was certainly very rare to find it resulting in an extra root, as in this case.

He had only met with one, which he would pass round, and they would see that it only differed from Dr. Edwards' one in that the distal root continued in contact with the larger root.

As showing that the same thing occurred in other teeth he passed round an under canine, in which they would see that a fault in the labial cervical margin of the enamel was accompanied by the presence of an extra root, which started just a little below the neck on the same surface.

As regarded the use of the term "geminous tooth," or as more frequently styled geminated, Dr Edwards was quite correct, as there are three forms—1st, lateral union of both crowns and roots; 2nd, union of crowns, roots more

or less distinct; and 3rd, crowns more or less divided, roots united.

The existence of one or more pulp cavities and canals, depending on the extent to which the conjoined teeth had lost their individuality.

The quotation from Dr. Thomson's paper, however well it might apply to members liable to hypertrophy or atrophy, according as the individual used them, bore little on the subject before them. Hereditary defective structure was extremely general, but certainly not any prevalence of aberrant, or rudimentary forms. Conoid laterals, biscuspids, and third molars are still in a small minority.

It might be said that want of use leads to defective development of the jaws, and that in turn to suppression of certain teeth owing to want of room, but this conclusion is largely an assumption.

Undoubtedly rudimentary forms in certain teeth, as also suppression of the same, are hereditary more or less for a generation or two, but the customs of civilized man do not encourage their persistence. In the lower animals either could readily be made a permanent variety.

As to the suppressed incisor being the central one, he thought that on two grounds they might be put out of court — 1st, the incisors in man being largely prehensile, and the centrals normally the strongest and most important, they should be the last to be suppressed; 2nd, when five or six incisors are present, it is very exceptional for more than two (the centrals) to be of the central type.

No conclusion can be drawn from the period of eruption as in the permanent series the overcrowding frequently leads to the retarded eruption of the centrals long after the laterals and supernumerary teeth were in place. In two cases of extra incisors which came under his own observation, the middle or second incisor erupted after both the central and outer incisor were in place. While in the third all four laterals were more or less advanced (the outer ones most so) before the centrals erupted.

In the temporary series there was little irregularity produced by their presence. but there seems a strong tendency to the extra incisor being geminated to one or other of the normal ones.

What he regarded as the typical form of the lateral incisor was just that described by Dr. Edwards. It differs from the central (taking its labial aspect only) in being more V-shaped, in its lateral convexity being greater and most pronounced nearer to its mesial side, and in being shortened to and rounded off at its distal cutting edge.

Digressing to the missing premolars, his own observations would lead him to say they were the third and fourth.

As regarded the supernumerary teeth not unfrequently met with to the buccal surface of the molars, he was rather puzzled, having met them between the first and second, second and third, and in one case to the distal side of the third molar. He had also met with a few cases in which they were geminated with one or other of the molars. So far as he had seen they differed considerably in form from those met with in the front of the mouth.

He was afraid he had occupied too much of their time, and would conclude by asking them to compare closely the lateral and canine he had sent round with the lateral (Case 8) of Dr. Edwards', and say whether they agreed with him.

Mr. Amooresaid he had listened with great interest to Mr. Wilson's close criticisms upon the paper, and if there was more to be learned from differences of opinion than concurrences, they might learn something from what they had heard that evening. He dissented from Dr. Edwards in his opinion that, of the incisor teeth, the centrals would be the most likely to be suppressed first. To quote from the text of his paper—"The incisors are the teeth of prehension, and the centrals naturally are the most prehensile; therefore, if suppression has taken place through disuse, I infer that the original centrals would be the first to disappear." Now, if suppression has taken place, it would surely be the less used side teeth which would disappear previous

to their more serviceable central neighbors. This view is borne out by references to comparative dental anatomy, where the side teeth sometimes become quite rudimentary or are lost, while the centrals often rather developed and increased in size and strength.

He then exhibited a model of a well-formed upper jaw in which there were two teeth erupted buccally between the second and third molars, and which tallied exactly with a similar case referred to and described by Dr. Edwards. One of the supernumeraries had been extracted and showed a conical root, while the crown more resembled a bicuspid than a molar, and although he had no strong grounds for his opinion, he could scarcely bring himself to believe that they were representative of a lost third pre-molar, springing up in this out-of-the-way position; he thought it rather straining a point, whenever a supernumerary tooth appeared, to give to it a place as a reappearance, in imperfect form, of a tooth once commonly present but now suppressed. In the same way he differed from Dr. Edwards, though confessing that he had not given the matter so much attention as he (Dr. Edwards) had done, in so often assigning, as a reason for spaced teeth, that it was an effort on the part of Nature to allow room for a tooth once present in the jaw, but now absent. This was notably the instance in Case 5, already referred to by Mr. Wilson, in which a space existed between lateral and canine on the one side of the mouth only, and, as had been remarked, was more likely to have been caused by an irregularity in the development of the bone at the inter-maxillary suture—or possibly the undue retention of a temporary tooth on that side, or it might even be due to an irregular articulation with the lower jaw. How common it was to find, when the laterals were absent, that the centrals were spaced, and when, during of eruption of the incisor teeth in children, a long interval of time elapsed between the appearances of the centrals and laterals; the centrals often remained with wide spaces between them until the laterals came down, when the space gradually closed

up. He had models of a jaw in his possession which he should have liked to have had Dr. Edwards' opinion upon; it was a typically well-formed and faultless mouth and jaw, with the teeth all present, but on either side between the canines and the first bicuspid there existed well marked spaces. From their position he would attach no significance to the circumstance, attributing it rather to the effect of articulation with the lower jaw than to any other cause. Returning, however, to the missing incisor again, he had a case, of which, he regretted, he was unable to exhibit the models. In it a temporary supernumerary lateral was succeeded by a supernumerary permanent lateral, in either case it being impossible to determine, from the crowns, at all events, which was the extra tooth.

With regard to the carved ivory model of a lateral tooth, which they all admired so much, he was more inclined to agree with Mr. Wilson's views upon the question, and think it more probably a double-rooted lateral than a geminated tooth, although he scarcely thought that the teeth Mr. Wilson had passed around proved his point, though they certainly tended to confirm it.

He trusted that any exceptions that he himself, among others, had taken to Dr. Edwards' paper, would not be taken as due to a want of appreciation, but when, as in the present instance, there were so very few reliable data to argue from, there would necessarily exist many differences of opinion.

After several members had taken part in the discussion, the President said that nobody would be more pleased than Dr. Edwards himself in reading those opinions which differed from his own opinions. The whole of the paper was more or less a tentative one, expressing views which might reasonably be deduced from facts accompanying it, but by no means claiming for these views the value of demonstrated deductions. The great object Dr. Edwards seemed to have in his paper was to contribute a few more facts bearing upon an interesting and much neglected vein of

research, in order that interest in it might be further awakened and perpetuated in this direction, and tend to the collection of such a mass of instances and illustrations as would furnish a sufficiently broad basis upon which to build a conclusion. The paper had most admirably fulfilled its purpose, and he hoped that they would be frequently favored with communications from their youngest corresponding member.

The President then called on Mr. Watson for his promised demonstrations for the evening,

Mr. Watson proceeded to give an exhibiton of slides, illustrative of Dental Pathology and Physiology, by means of the Limelight Lantern Microscope.

Without attempting to describe the instrnment technically; there were a few points in connection with it that would be interesting to remark upon. To fit up the lantern for the microscope, the ordinary objective in connection with it is removed, and the microscope lenses and apparatus screwed on, the objectives used on this occasion being 150, 90 and 30 diameters, on the relative value of which, in connection with the lantern, some remarks are made further on. One of the most ingenious contrivances in connection with it was the method by which a continual supply of oxygen could be maintained without the inconvenience usually attendant when bags are employed. The gas-holder consists of a bell capable of containing about $1\frac{1}{2}$ cubic feet of gas, inverted in a water chamber below, holding a good sized bucket full of water. This arrangement when in use serves as a stand for the lantern, and when emptied for travelling, the lantern can be packed away within it. The supply of oxygen is obtained from heating by means of a Bunsen burner, a cake made of powdered chlorate of potash, and the black oxide of manganese enclosed in a strong iron retort, whence the oxygen is evolved and conducted by a tube into the gas-holder; when more gas is required, another cake is supplied, and the process repeated, and thus a persistent supply of the gas can be maintained as long as desired.

The exhibition was a very interesting one, and showed the microscopical conditions of the teeth, from the germ to maturity, and in the different stages of disease; and toward the end sections of tumors having relation to the mouth were also exhibited. The sections were best seen with the lower powers of the microscope, as at present it was impossible with the instrument to bring out the smaller details as clearly as when the object was examined upon the stage of the microscope in the ordinary way, the definitions becoming indistinct as the powers were increased.

Later on, Mr. Watson exhibited some photo-micrographs of the dental structures, in which the details were brought out in a very satisfactory manner, and if by further adjustment and development the lantern microscope could be made to transmit as clearly the image, from the mounted specimen to the canvas direct, it would prove an almost indispensable instrument for purposes of instruction in class lectures.

At the conclusion of the exhibition, the President complimented Mr. Watson on the success of the demonstration, and tendered the thanks of the Society to Mr. Watson for his interesting and instructive exposition of the microscopic structures of the teeth.

On January 14, the third General Meeting of the Session was held, the President, Mr. Bowman Macleod, in the chair.

Mr. Price was called on for his remarks on Dr. Coffin's method for treating irregularities of the "split plate" and the use of piano wire. Through the kindness of Mr. Harold Coffin, he was enabled to exhibit a large series of models, illustrating the different types of results that could be obtained through its agency; and also plates and cases in various stages of preparation, showing the most advised methods of construction. As the subject had been so thoroughly treated by Mr. Walter Coffin, and already chronicled in the Transactions of the International Medical Congress in 1881, (vol. III p. 542; also in *Dental Record*, vol. I p. 112), it was thought unnecessary to republish any of the matter in

the Society's Transactions, but as many of those present had either not seen, or had no opportunity of examining the models at leisure they were the occasion of considerable comment, and some of the details of their construction and technical "wrinkles" were new to several. Many of the members who had adopted it testified to its simplicity and value, at the same time venturing to doubt if, in some of the examples before them, the expansion treatment had not been ill advised, and that extraction would have yielded better results; but as they had not the lower articulations with them, nor the contour of the patient's face to assist them in their judgments, they were unable to pronounce any final opinion.

In summing up the opinions of members, the President said that he regretted very much the impossibility of sharing with absent members the great good which those present derived from the presentation of such a practical subject in the form in which it had been brought before them. Most of the members questioned the expediency of some of the operations for expansion of the arch as illustrated by the models on the table, and he quite agreed with them, and very possibly Mr. Coffin might now also share their views. One thing, however, was certain, that the introduction by Mr. Coffin of piano wire for regulation of teeth and expansion of the arch was a decided step in advance of any previous contrivance for these purposes. It was a remarkable illustration of the power of simple instruments when directed by brains. He had much pleasure in moving a cordial vote of thanks to Mr. Coffin for the loan of the series of illustrations, and also to Mr. Price for his most entertaining and lucid description of them.

COMMUNICATIONS.

A casual communication from Mr. John Wood, Dumfries, was read, referring to the untoward accident in Mr. Saunders' practice at Barnstaple, in which the blade of a pair of upper biscupid forceps broke off during an opera-

tion, and slipping down the trachea, became lodged in the right bronchus, from which it was extracted by Sir William M'Cormac, seven weeks afterwards. It appears that the broken instrument has the name of "Evrard" upon it, but some doubt has been expressed as to whether it is a genuine instrument of his make, or merely an imitation of a spurious character. Be that as it may, by way of showing that such an accident is possible, even where there can be no question as to the genuineness of the manufacture, I submit for inspection by the members of the Society, a pair of excising forceps by Evrard, in which there is a fracture extending half way across the neck of the left blade in pretty much the same situation, and so far in the same direction as that which the line of fracture takes in the broken pair figured in the *Lancet* and the *Journal of the British Dental Association*. As will be observed, however, the fracture in this pair, instead of continuing its course *across*, has taken an inclination towards the line of the handles, which in some measure accounts for the blade not breaking off altogether, as in the Barnstaple case. That this instrument was made by Evrard is beyond dispute. It bears the well-known impress of his name, and forms one of a set of twenty instruments furnished by the late Mr. Evrard to special order, and presented to me by a patient. The mishap to this pair happened a short time ago, whilst being used in excising an upper front tooth, and surprised me not a little, having regard to the apparent strength of the part at which they gave way.

Mr. Stirling showed a continuous gum facing, from Verrier's furnace, where the platinum wire was soldered to the pins of the teeth with dental alloy. He said the advantage of dental alloy over pure gold as a solder is that it remains around the pins (where it is placed) until after the piece has been finally fired, whereas the gold usually runs away from the pins and flows all over the platinum wire.

Mr. Stirling also presented to the Society's museum the molar of a horse, the roots of which were involved in an

odontome of considerable size and which he had exhibited at a previous meeting.

Mr. Wilson exhibited an upper lateral, which simulated in a remarkable degree a lower canine.

Mr. Macgregor showed two models, the one of a girl of 15, with a well marked V-shaped maxilla. The teeth were prominent, and he judged that the conformation of the mouth was due in a very great measure to the habit of food sucking of which he knew the patient was guilty.

The second model was of the upper jaw of a girl of 12, and peculiar in exhibiting a first right bicuspid of abnormal size and shape, from its appearance giving one the idea that it was probably a geminated tooth,—*Dental Record*.

ARTICLE II.

NON-FISTULOUS ABSCESS.

BY DR. KULP.

I understand the subject is diagnosis and treatment of a dormant abscess, or an abscess that has not a fistulous opening, *i. e.*, is not giving any perceptible trouble. Of course, when we have pain and swelling we may expect the formation of pus, and later an abscess. I think that many of these cases give a very great degree of trouble, because we over-treat them.

The question has been asked, why is it after the cavity has been opened we have pain? I have yet to know when there was no pain previously that immediately when I opened the cavity I caused pain unless I take an instrument and force it up into the canal, or force something through the opening, either air or something else. In that class of uncertain cases I use a great deal of care, for even forcing

up a broach will force up air to disturb it. It is necessary to be exceedingly cautious. If I find the nerve is obliterated, if I find a lump of enlargement on the outside, one of these old chronic cases, I should open the canal cautiously. After opening it, I direct the patient to perform the operation of suction upon the tooth. Then place a little piece of cotton saturated with creosote and tannin and place it in the root. I am cautious not to place it so firmly, as to force up air. Let it remain for twenty-four hours, then place in dry cotton, which will absorb all the exudation of pus that may come from the end of root. If you thus encourage nature instead of disturbing her, you will seldom be troubled with the pain complained of. This treatment can be continued until there is no further formation of pus; then you can fill the tooth. If I should have trouble after the tooth was filled I should take Dr. Ingersoll's plan of stimulating and assisting nature. Instead of capsicum I should take a saturated solution of creosote and iodine. As to the point of difference between abscess and ulceration of the peridental membrane, I agree with him that we may have pus at the end of the root without an abscess. I do not believe we have an abscess where there is no fistulous opening; you will find that the greatest trouble comes from teeth having an abscess and drainage through the canal; when you come to close up the drainage you will have trouble; it may become necessary to force a fistulous opening before you succeed in those cases. In cases of this kind I have found my greatest success to be with the use of creosote and tannin. Dip cotton in creosote and then in dry tannin, then place it in the canal very carefully so as not to force anything through the root. In twenty-four hours remove it and then dress with dry cotton; that will usually stop the trouble. There is trouble in over-treating. As soon as the pus secretion ceases, while nature is making an effort to carry away this membrane forming at the root of the tooth, at once fill the tooth. By continuing to treat it from day to day and from week to week, you will never get your case well. I have filled for years all canals, particularly canals of this kind with os-artificial.

The method I adopt is to put a little powder on a glass slab, and then some of the liquid by the side of it; then take a smooth pointed broach and put on it a shred of cotton, wrapping it smoothly, and then with that instrument and the cotton on it, the powder is pushed into the liquid and mixed, making it about as thick as cream. The quantity on the cotton is sufficient to fill the canal. Put the broach up into the root as far as you can; then, by giving it a pumping motion, you can withdraw the broach from the cotton, with the cotton drawn back into the larger part of the canal; take hold of the end of the cotton and pump it up until you have exhausted all the air out of the root, up to the apex. Your patient will flinch just as you reach the apex. The great point of caution I want to make is the danger of over-treatment of these cases. I don't think they are so very difficult, if proper care is taken in the first steps. I do not see any reason why we should make so much ado about such cases, when we create the mischief ourselves. There are some cases where there is thickening of the peridental membrane. That is not blind abscess. I call that ulceration of the peridental membrane, and treat that as I would an ulcer. I do not think the profession know fully the value of tannin combined with carbolic acid and creosote.—*South-ern Dental Journal*.

ARTICLE III.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN

The Annual General Meeting of this Society was held on January 11th, Mr. C. Spence Bate, F. R. S., President, in the chair.

Mr. S. J. Hutchinson related the following case:—In October last a gentleman came to him suffering from almost

complete closure of the jaws ; he could only separate them about a quarter of an inch, and was, of course, unable to eat. He had been in this condition about a month. Mr. Hutchinson found that the inability to move the jaws was due to muscular contraction, with infiltration and induration of the surrounding tissues, and diagnosed an impacted wisdom tooth, but was unable to make a satisfactory examination of the mouth.

At the patient's next visit gas was administered and the jaws separated to some extent by a screw gag. It was then found that the left lower wisdom tooth was completely buried under the ascending ramus of the jaw ; it was also decayed and had an abscess at the root. In order to get at it Mr. Hutchinson felt obliged to extract the adjacent second molar, and this was at once done. After an interval of a few days gas was again administered and an attempt made to dislodge the wisdom tooth, but the patient recovered himself before this could be affected.

Perceiving that the operation would be a difficult one, Mr. Hutchinson arranged with the patient that he should have chloroform at his own house, and this time the tooth was successfully extracted, though not without a good deal of trouble, for the tooth was lying horizontally and buried under the ramus of the jaw.

Mr. Hutchinson thought that the plan of administering chloroform at the patient's own house, instead of at that of the practitioner, reduced the risks and inconveniences of this agent to a minimum. The patient could be operated on undressed and in a recumbent position ; he was not fatigued, as he might be when he had to come some distance in a fasting condition, and he was less flurried. Finally, he could lie quietly after the operation and recover himself at his leisure.

Another point of interest in the case was the length of time the contraction persisted after extraction of the tooth. Three weeks after the operation the patient could only open his mouth three-quarters of an inch, and he had, in fact,

only just regained the free use of his jaw, though the operation took place in October.

Mr. Charters White said that about two years ago he had been called upon to treat a precisely similar case. Thinking from the amount of indurated swelling, &c., that there must be some disease of the jaw, he sent the patient to Mr. Christopher Heath, but that gentleman sent him back again, saying he considered it a case for a dentist, and on examining the patient more carefully Mr. White discovered that the cause of the mischief was an impacted wisdom tooth, embedded in the ascending ramus of the lower jaw. The patient could not separate his teeth more than a quarter of an inch, so that it was difficult to introduce forceps, and still more so to manipulate them in the mouth, but Mr. White managed to reach the tooth with some long narrow curved forceps, and to raise it out of its socket, and at the patient's next visit, the swelling having somewhat diminished, he succeeded with the same forceps in removing it altogether.

Mr. Henri Weiss said that in five or six cases of prolonged operations in the mouth he had used the well-known A. C. E. mixture, composed of alcohol one part, chloroform two parts, and ether three parts, by measure, and had found it to act very satisfactorily. The patients recovered quickly and there were no bad after-effects.

Mr. R. H. Woodhouse said he knew that the extraction of lower wisdom teeth was sometimes attended with a good deal of difficulty, and he believed that this arose from overlooking the fact that these teeth, when misplaced, were almost invariably inclined to the inner side of the ramus. He found that by inserting an elevator on the outer side, and making a continuous movement inwards, he could dislodge them without any trouble. He believed the difficulty arose from making an outward movement; it should be entirely inwards.

Mr. A. S. Underwood said that, in the years 1878 and 1879, Dr. Bodecker, of New York, published in the *Dental*

Cosmos some papers on the microscopical anatomy of the teeth, in which, amongst other things, he asserted that the presence of protoplasm between the fibres of the enamel could be demonstrated by staining sections with chloride of gold. He described his process as follows :—He first decalcified the teeth by means of chromic acid, then cut sections, and stained these by placing them in a solution of chloride of gold, and exposing them to sun-light for twenty-four hours or more. Now up to that time it had always been stated that chloride of gold would only stain tissues which were absolutely fresh. The text-books said it was useless to attempt to stain tissues which had been deprived of life for more than an hour, and a distinguished microscopist to whom Mr. Underwood applied for information on the subject replied that it was hopeless to attempt staining with the chloride unless the tissues were fresh, and even in that case four out of five of his sections would turn out failures.

Wishing to verify Dr. Bodecker's observations, if possible, Mr. Underwood undertook a series of experiments in order to ascertain whether it was possible to stain decalcified sections with this reagent, and what was the best method of using it.

His results with the method described by Dr. Bodecker had been uniformly unsatisfactory; he could not get a single section which showed anything clearly. But he found, nevertheless, that any section could be stained, and that it really did not matter whether it was fresh or not. The method which he had found the best, and which he had finally adopted, was as follows :

He immersed the section, whether cut from a decalcified tooth or ground down from a hard one, in a solution of carbonate of soda for an hour. Then he placed it in a solution of chloride of gold, which must be neutral, and left it in the dark for another hour. It was then again placed in the carbonate of soda solution for a few minutes, and then transferred to a one per cent. solution of formic acid, and kept warm over a water bath for about an hour and a

half. Finally the section was mounted in glycerine jelly, not in Canada balsam. Sections which have been decalcified by chromic acid took longer to stain than those which were fresh, but the whole process only occupied from three to four hours, instead of at least twenty-four as in the old method, and the result would be found far more satisfactory. The usual needles, or any steel instrument, must not be used for manipulating the sections; some non-metallic substance, such as a quill tooth-pick, should be used instead.

He found that the most satisfactory method of grinding down hard sections was to grind them tolerably thin against a fine corundum wheel, and afterwards to finish with an Arkansas wheel. In this way the section could be ground down to any required thinness with little risk of injury.

Mr. Charters White said he gathered from Mr. Underwood's remarks, that though it was possible to stain a decalcified section, it was better to grind down a fresh section and stain at once.

The President remarked, that grinding down a hard section between two Arkansas stones saved both the operator's time and his finger.

Mr. Underwood replied that fresh sections were not only easier to stain, but were in all respects much more satisfactory than those which had been decalcified, since the former presented the tissues in their natural condition, whilst in the latter they were more or less affected by time and by the reagents. Consequently, when decalcified specimens were used, there was always a doubt whether the appearances seen were really natural, or whether they were the effect of the reagents. He thought the use of the finger was the safer way of finishing a thin section, and if necessary the finger could be protected by attaching the section to a piece of cork or rubber.

Dr. George Field drew attention to some samples of Dennison's absorbent cotton, an American preparation. He had given it a thorough trial, and was convinced that there was nothing which surpassed it as an absorbent for dental purposes.

He wished to suggest a new use for cocaine—new, at least, to some of those present—viz., in the fixing of the rubber down by means of a ligature around the tooth, especially in the cases frequently met with where it was necessary to force both the rubber and ligature between the tooth or teeth and gum, on the approximal and buccal surfaces of the former. His method of using it was as follows: He first thoroughly dried the cavities and the adjacent gum margins, then by means of a wedge-shaped piece of wood he applied the cocaine between the teeth and the gums, first adjusting a napkin as a protection from moisture. He preferred to use the crystals. Then he prepared the rubber, elastic bands, weights, ligatures, &c., and when everything was ready to hand he made another application of the cocaine. On now proceeding to adjust the dam, it would be found that the ligatures could be forced well under the gum with but little, if any, pain to the patient, provided that the application had been properly made. This operation, which, though absolutely essential for the success of fillings in the position named, was usually exceedingly painful, was thus rendered almost painless; a good view of the margins of the cavity was thus obtained, with dryness, and it greatly facilitated the removal of all surplus material overhanging the margins of the cavity, an oversight which, in his experience, was the cause of more failures than any other defect in filling operations.

He also offered a few general remarks on the question of the extraction or the retention of roots. When, he asked, should roots be extracted, when retained? When was it advisable to pivot, and when not? Preparatory to the insertion of an artificial denture all roots which could not be put into a good healthy state, fit to receive a crown, should be extracted. In the case of patients who, it might reasonably be expected, would not take sufficient care to keep their teeth, roots, and gums in a cleanly condition, it was wiser to extract all roots; otherwise in from six to twelve months the result of the want of judgment would be seen

in swollen face and gums, abscesses, &c., and a state of mouth generally which was a source of great discomfort to the patient himself, disgusting and offensive to his friends, and discreditable to the operator.

He expected to meet with the usual objection—the consequent absorption of the alveoli, &c. But this should have no weight in comparison with the inevitable bad results just named; in addition to which there could be little doubt that the quantity of suppurative matter constantly passing into the stomach must be prejudicial to the health of many patients. If the roots of any of the ten anterior teeth of the upper jaw were strong, pivoting in the best possible manner should be given the preference over a plate, as being less liable to injure other sound teeth and of greater practical service, provided the operation be performed with even a moderate degree of skill; giving special attention to the stopping of the foramen of the root, obtaining a good joint between the root and crown, having no shoulder either of root or crown, and lastly removing every particle of the cement used for fixing the crown which may have been pressed out at the joint.

Speaking from his own observation, he had never yet seen a case for the insertion of a full denture, the conditions or circumstances of which would warrant the retention of the roots; whereas he had met with cases in which the retention of numerous diseased roots covered by a plate had proved prejudicial to the general health of the patient.

He did not present these suggestions as being anything new, but rather to call attention to the fact, which at times seemed to be lost sight of, that the mouth should be treated in the same way as any other part of the body, and that it was the duty of the dental practitioner to maintain it in a healthy condition by every means in his power, therapeutic as well as mechanical.

Mr. Storer Bennett showed a lower jaw, found at Bath some years ago amongst Roman remains, which had been presented to the Museum by Mr. Forsyth. On comparing

it with a typical modern specimen several differences would be apparent, especially the distances between the condyles and the large size of the ascending rami. There was but slight mental development, and the teeth were not quite regular; they were much worn, but there were no signs of caries, and, contrary to what might have been expected, the wisdom teeth were small.

Dr. George Cunningham showed some specimens illustrating the difficulties and disappointments of Continuous Gum Work. He had used the same furnace (Verrier's) throughout, the details of the process had been carried out in the same way and with the same amount of care, and yet after a period of success, when he thought he had conquered all difficulties, several cases in succession had turned out badly, the enamel being unequally fused and cracked on the outside of the plate. He could not himself explain the cause of his non-success, nor could he get any one else to explain it. The only difference between the good plates and the bad was in the enamel used, though both had been obtained from the same makers, the S. S. White Company, but that used for the successful cases had been on hand a long time, whilst new enamel had been used for the failures. He should be very glad if any one present could tell him whether their experience had been at all similar, or could enlighten him as to the probable cause of his failures.

He wished also to call the attention of the Society to Dr. Land's suction chamber; he handed around a denture made according to his pattern. Dr. Land's suction chamber was large but shallow. He himself had for some time past altogether abandoned the use of these chambers and used the Fulsome ridge; but lately he had been induced to make some comparisons between the two, and had found Dr. Land's method of great use, and he could therefore recommend others to give it a trial.

Dr. Walker said he had met with the same difficulty in firing continuous gum cases, using Verrier's muffles. He would suggest that the bad results were due to the unequal

temperature of different parts of the furnace, and that this might be obviated by having a better supply of gas. He thought that if Dr. Cunningham would have a larger supply pipe fitted, not less than $\frac{3}{4}$ inch diameter, inside measurement, the heat would be equalized, and he would meet with no more failures of this kind.

Mr. D. Hepburn called attention to the following plan for improving the adhesion of suction plates. All must have experienced the difficulty which was not unfrequently met with in establishing the confidence of patients in suction plates, especially when first applied. Even with the most perfect model, the most accurately adjusted arrangement will often at the first offset show no tendency whatever to adhere to the gum, and the patient may have to undergo many days of discomfort before adhesion is established. He had tried to overcome this difficulty by coating plates with various substances of an adhesive nature, in order to spare the patient a disagreeable ordeal, and he was aware that similar attempts had been made by many other practitioners. Thus he had tried sprinkling the plate with flour and painting it with various gums and mucilages, but with little success, most of these substances being rapidly dissolved and washed away. For about a year, however, he had employed powdered gum tragacanth with the most satisfactory results. Indeed, the most refractory plates, when this substance was used, would adhere with a certain amount of tenacity, and frequently could not be dislodged without a considerable effort.

The best method of application was to keep the powder in a bottle with a piece of muslin tied over the mouth, and to sprinkle the plate with a thick layer of the powder before putting it into the mouth. The saliva would in a short time convert the tragacanth into a glutinous and almost tasteless layer which would remain for days. In obstinate cases the patients could themselves apply the powder daily, and found much comfort from so doing.

This use of tragacanth had been suggested to him by a

patient of great ingenuity, and he had never met with any substance which would act so efficaciously. Having experienced its utility himself, he wished to suggest its employment, for the purpose referred to, to other members of the Society.

Mr. R. H. Woodhouse said he had found powdered gum arabic of some use in such cases, but at the suggestion of Mr. Hepburn he had lately used the powdered gum tragacanth and had found this very much better.—*Dental Record*.

ARTICLE IV.

"ATMOSPHERIC ANÆSTHESIA."

WHEN DISCOVERED AND APPLIED BY THE UNDERSIGNED.

BY W. H. RICHARDS, D. D. S., KNOXVILLE, TENN.

My boyhood days were spent in Salem, Va., at a time when coal was not used as a fuel, and fires were, of course, made of wood—to kindle the same often requiring much blowing, if the wood were damp and tinder scarce, (which was often the case at the time in particular of which I write, 1865) made memorable to many, who, on account of the recent unpleasantness, had to be their own hewers of wood, and do their own blowing, or freeze. I never thought to ask, before it came *my* turn to *blow*, whether the task was accompanied with unpleasantness or dizziness. No doubt, "Cuffy," from long practice in the art, which could not be acquired without much suffering—for suffering it was to me—was not affected thereby to any great extent; but at times I would be compelled to stop blowing and lie upon the floor, until my head and brains would be capable of taking in my surroundings.

I thought much of the effect of that class of "blowing" as I grew up, and when I became acquainted with the effects of nitrous oxide, in 1873, I was impressed with the similarity of sensation, and made this test upon myself, in the presence of an M. D. friend, who took my temperature and pulse, which, after as many rapid respirations as I was capable of, showed slight degree in temperature, augmented pulsation, much languor and lassitude, a tingling sensation in the fingers, such as is experienced under gas, or when, as we say, our hand is asleep.

In addition, there was much perspiration. In fact, I was exhausted, and might, or would, have submitted to a small operation, while in the acme of languor, indifference, or analgesia, if you please.

It was in 1875, when a very delicate young lady called to have a tooth, which I had been unable to cure of periostitis, extracted. She was afraid of gas, and I did not urge the use of it, because of her condition, and advised the rapid respiration, which was adopted.

At her suggestion, I permitted her to carry the rapid respiration as far as possible, to satisfy her of the effects, promising not to remove the tooth until a second trial, if satisfactory. The result was convincing, and she readily consented, on recovery, to having the tooth out, "when I get that way again." I removed the tooth, a lateral incisor, filled the root, and replanted the same. I called to see her, at her residence, next morning; found her pleased with the result, and was surprised to hear her say she was confident I had given her gas, in some way, and would not be convinced to the contrary, until she tried the experiment of rapid breathing alone.

My experience teaches me that this kind of anæsthesia is fitted to those who are in an exalted nervous condition, and the secret of the success depends upon the party keeping his mind upon agitating a great deal of atmosphere. If you can keep the mind upon anything but the tooth, it will do as well.—*Southern Dental Journal.*

ARTICLE V.

DENTAL SPIRITUALISM.

BY LOUIS OTTOFY, D. D. S., CHICAGO.

The vastness of our theme hardly admits it to be as fully treated in a single paper, as we should desire, because it forces the discussion of the undecided and indefinite questions of "vital force," "magnetism," "mental force," "electricity," "nervous force," the circulation of the blood and other questions which at first seem remote to the subject. There might be some objection to the use of the word "spiritualism," in a strictly scientific essay, and to clear away any doubt as to its propriety and at the same time explain its meaning, I quote from Prof. Elliott Coues: "No scientist who acknowledges the validity of the science of psychology, and no philosopher who recognizes the validity of abstract ideas, objects to the word mind." I must therefore be permitted to speak of spirit, or 'soul,' if you please, as something which, like mind is a legitimate subject of inquiry: first, as to whether it exists or no; second, if it exists, whether it be of protoplasmic nature or no; third if it be not that product of the aggregation of matter, what sort of a product it may be, for I consider this inquiry especially pertinent to any discussion of life. Our alternative, you know, is, that all vital phenomena, all manifestations whatsoever of life, are to be counted among the accomplishments of protoplasm, or are to be otherwise accounted for.

"Much difference of opinion as to the reality of 'soul' might be reconciled if disputants could catch each other's meaning and agree upon a definition of the term. But this is very difficult though we all know what is meant when a human soul is in mention. Many deny there is any such thing; many waive the question, neither affirming nor denying; most ascribe a soul to man alone; some concede a

soul to every atom of inorganic matter as well as organized bodies. My view defines soul as the quantity of spirit which any living being may or does possess at any time. But this requires a definition of "spirit" from which all conceptions of matter are not absolutely excluded. Spirit is nothing if not immaterial; force is likewise immaterial, but I think all persons recognize a distinction between spirit and any mechanical force, such as gravitation. My mind affords no definition of spirit, if I may not call it *self-conscious force*. Self-conscious force being illimitable in time and space, and its sum being, in a word, infinite, I am unable to draw any distinction between spirit in its totality and that Universal Mind or Supreme Intelligence, which we mean when we speak or think of God."

The question of the existence of forces in the human body, whose exact mode of action is not fully understood, is an open and disputable one. No one present, doubts the assertion that what are known as nervous, mental, and vital-force, are not yet entirely understood by the physiologist, psychologist or philosopher, and yet that such forces do exist, and that they form an active part in our every day life, is not questioned. Even the most pronounced sceptics of the present day admit that there is something in the Universe, call it by any name, which is something more than human.

Whether thought and its accompanying peculiar phenomena, are simply molecular changes and take place without the presence and influence of any force outside of the simple chemical combustion of cells, is not satisfactorily established. Indeed, that the circulation of the blood is by no means fully explained by physiologists, is equally true. Thus it seems that some functions which take place within our body, are not to be explained by either the advanced position of chemical or physiological sciences, forces are at work which do not allow themselves to be analyzed the same as other actions with which we are familiar. In fact, this condition clearly tends to indicate the existence of some

power within the body which is not a portion or parcel thereof. The law of the convertibility of force into matter and *vice versa*; and the indestructibility of force and matter being unquestioned, it is doubtful how any thinking person can entertain the belief, that all the functions of the body cease with death, and all is ended. It is true that the chemical elements return to their original condition, but as force can not be destroyed, what becomes of the peculiar vital and mental phenomena? These conditions of facts are leading the most sceptical thinkers, to the admission, that there is something within the body, a spirit, a soul, a part of the macrocosm, if you please, which has not yet placed itself at the disposal of man's investigative inquiry, and which by the inevitable laws of God, remains sealed to mortal man.

De Wette the great learned rational Universal doubter in Germany admitted amid the "sneers of the acutest school of rationalism of which he was the leader," the existence of something beyond materialism. Evolutionists and sceptics, have within recent years placed more flexibility on former expressions, and even agnostics are gradually falling from their creed. Science and knowledge yield reluctantly to the inevitable truth

An infinite existence certainly permeates all things which we denominate as living, and in the course of nature, that force is everlasting. There is no question that every living cell, from the simplest form of organization to the most complex, contains within it in a condensed spiritual form, its full capabilities, its every possible reproductive power is there outlined, and by its very essence it is capable of filling space in any scale from the micro to the macrocosmic. In this connection the well-known fact may be mentioned, that breeders can reproduce a certain color or spot in an offspring, by exposing to the view of the parents during coition an animal of that color, or with that particular spot, how is that color transmitted? The spermatozoid carries stamped within its microcosmic compass the full

spiritual form not only of the future being but of all generations therefrom to issue. There is no doubt but that "life" can exist without being observable by our senses, as it would invariably have to be in a material form for that purpose, no material substance, containing "life," however, can exist without a spiritual outline. That such a form which may be designated ethereal or spiritual, does exist, is borne out by numerous invincible facts, especially by the laws of physical reproduction and heredity. In cases where bodily injury is perpetrated, nature reproduces or endeavors to reproduce the parts in full conformity with the existing outline, excepting in such cases where the injured parts are too complicated. Illustrations in support of this fact are numerous, especially so among the lower forms of life, as the crustaceans; in the tadpole the tail or entire leg are reproduced. Amputated human limbs or other complex parts are not reproduced because of their complexity, but the existence of their spiritual outline, can be hardly questioned; it is well-known that persons who have suffered amputation, often complain of feeling pain in the toes or fingers of the amputated member, and also, that they are capable of moving them, but of course, can perform no action with them. It is not infrequent that pain is felt in the *spaces* (not the sockets) where teeth formerly were; artificial teeth are also known to "ache." The established laws of heredity furnish very satisfactory proofs of the existence of a spiritual outline (in a condensed or compressed form) in the spermatozoid, or ovum, or both: and one of its convincing proofs is well illustrated, in the cases of six-toed or six-fingered persons, where successive amputations, in successive generations, of the supernumerary organ have failed to eradicate it in the offspring. A few years ago I saw somewhere expounded the theory, that by extracting in every person all the second bicuspid, in course of time those teeth would not be reproduced, and that thus the overcrowding of the teeth will be averted, but the foregoing practical illustrations prove the fallacy of that idea.

That the cells of the brain should within their physical selves contain the power by which its marvelous results are produced, that all forces originating from that central nervous organ should take place on the same principle as all other productions of force, namely by the combustion of cells only, is certainly very much in question, and the fervency of such an advocacy is mainly due to a formerly very prevalent sceptical notion of materialization, it having been considered unscientific to entertain *any* views, unless they can be demonstrated to the senses by known arts. However, the fact that such a substance as hydrogen or oxygen exists, is not questioned, although neither has ever been observed by any of the senses. We judge of their existence only by their actions on other substances, which we know to exist; and so we judge of spiritual existence by its manifestations. That such a substance as a vacuum exists, or such a condition, if you please, is not doubted, and yet no sense has ever perceived it; the word "substance" is proper when speaking of a vacuum, as a space containing absolutely nothing is inconceivable in the Universe.

One other remarkable proof, which can only be referred to in this paper, of the existence of some unanalyzed power in the body is furnished by the wonderful process, which has baffled physiologists from Harvey's exposition to the present day, the circulation of the blood; it is a remarkable fact that there is no physiological work extant, which explains to the full satisfaction of the writer, sceptic or otherwise, that all the forces of the known body which are, or could be utilized, are sufficient to perform that process, if considered from a physical, mechanical or chemical standpoint; the propelling capacity of the left ventricle of the heart, the contractility of the coats of the arteries, the so-called suction force of the veins and the right ventricle, gravity, chemical affinity, capillary attraction, muscular compression upon the conduits, the affinity of the blood for oxygen in the lungs, and of the tissues for the same in the body, the siphon principle, or the influence of nervous force,

etc., all, and all other forces which are known to assist or which are supposed to assist in performing it, are insufficient to complete it. Although some of them are very essential assistants, nevertheless the force of the "vital principle" is *the* primary power. All forces live, as such or as matter in one form or another, and as the circulation of the blood is carried on (in addition to known physical, mechanical and chemical forces) by another unexplainable force, that force lives on forever. By the withdrawal of that one activity (life), the known forces which perform the functions of the body are altered, that withdrawn force, whether it be vital, mental or spiritual, exists in some form and somewhere, and indeed, it is but natural that the problem of life remain unsolved, its solution is the end of life in the capacity and form in which we understand life, or in other words to learn life, death must ensue; the familiar words "in the midst of life we are in death" are equally true when transposed: "In the midst of death we are in life."

Animal magnetism, personal attraction and repulsion, are certainly forces or conditions which come more or less under the observation of the dentist. There are not many practitioners who have made an effort to investigate the subject, but will readily admit that there is "something in it;" and there is no reason why this power should not be cultivated and used by the dentist to the extent at least, of partial anaesthesia during short operations of a painful nature. There are unquestionable men who can control and direct such an amount of magnetism into the body of a patient, as to insure insensibility to pain, that has been done; and that this sustaining power is not due solely to a previous preparation of the mind to receive the impression, that no pain would result, which might be the case to some extent, if a person was told that he is about to be magnetized, and that in consequence thereof no pain would be felt during the operation, is based on the fact that the hands were simply laid upon the temples (the patient being informed) for the purpose of placing the head in the proper position and

that the patient may become quieted. There are a large number of "nervous" persons who could be supplied by the majority of dentists, without very much loss to themselves, with a large amount of spiritual sustenance, which would help them to bear pain with more ease.

In nervous persons the condition is a want of *nerve force* not a super supply, such persons when in the chair and being operated on do draw on the *sympathetic* operator for a re-supply of nerve force to enable them to bear the operation. Some men whose own supply of nerve force is too small even for their personal wants may by greatly sympathizing so impart of their nerve force as to greatly benefit the patient, but always at their own expense, so that after a hard day's operating for such a patient as here described, they will be in a very nervous condition, that is, nerve force has been imparted till their is a decided want felt. Take a lady who is all used up with uterine displacements, backache, feeble health, no courage to bear pain, in other words as nervous as she can be. *If you will dampen your hands just a little and put them on her face and forehead for a few moments you will feel the loss of a something that you will say: 'I perceive that virtue (or force) has gone out of me.'*"

"I think direct contact is essential to this. In your operating for a robust healthy person you will perceive the difference very sensibly. Strong, robust, unsympathetic dentists do not freely give of their nerve force, the patient will soon distinguish the difference between such an operator and the one who, in their make-up is more like themselves; with a ready sympathy, a free imparting of their nerve force. They are very prone to patronize the latter rather than the former, so that if you will notice such operators have that class of patrons in a greater proportion than strong robust dentists.*

There is no question in my mind but that nearly every

*J. F. SANBORN, M. D., D. D. S.

patient is "influenced" more or less by the operator or *vice versa*, so for instance in the latter part of an exhausting day's labor at the chair a nervously powerful patient can supply sufficient spiritual power to the operator for his use to sustain himself without causing undue fatigue. Again, when both operator and patient are fully aware of a certain amount of pain which is to be inflicted to accomplish a certain operation, the patient, if spiritually so constituted, can "give off" sufficient power to not only assist the operator, but sustain himself as well without the fatigue to one and pain to the other, which otherwise would be the case. Dentists, especially such, who have among their patients a large number of the puny, malformed products of the higher class, those whose systematic functions have been chronically impaired by over-study, lack of exercise, or faulty exercise in excess, and such who live in feverish, malarial and other districts where malignant diseases are prevalent, should cultivate the power of magnetic or spiritual influence over their patients. To be able to "give a piece of one's mind" is very near the truth but is not grammatically correct, but to give one a piece of his spirit (which itself is an ethereal substance) is proper and capable of performance, and this is the secret of the success of a great many dentists. We among ourselves understand that influence by another name; we call it sympathy. Sympathy is nothing if it is not something which is capable of being imparted, and made part of the personality of another, and if it is such, it is a something which from its nature may properly be called soul force or spirit. Nay more, the expression, "the heart goes out in sympathy" is as true as it is beautiful, for it is known that very sympathetic persons feel that a something from their innermost selves draws toward the object of their sympathy.

This feeling of sympathy, then, is well worthy the cultivation of every dentist who treasures the welfare of his patients and it is but meet that we should be as humane as to take advantage of all forces, of all known appliances or

effects to alleviate as much as possible, existing pain, and inflict the minimum. It would cause surprise to listen to the experience of patients who have been under the care of several operators; making due allowance for temporary causes of difference in susceptibility for pain, what a difference there is in a sympathetic treatment.

There are some essentials in the exercise of this function of spiritual sympathy which we should bear in mind when desiring to diminish the suffering of a patient from existing pain, from pain inflicted by us in order to make our manifestations effective; the mere cold-hearted expression, "I am very sorry to hurt you so much," while a bland, icy smile is playing over our features don't help the patient very much to bear the pain; our professions, if it is necessary to make them by words, must be inspired by sincerity, truth and understanding; our actions must depict composure and steadiness. The patients should be able to read in our features that we understand his case and that our professions of sympathy are sincere, let our words (when speaking of pain) be truthful in every particular. Let us not suppress the fact that pain must be consequent upon our actions, there is no harm, however, in measuring and stating the probable extent of pain. A steady, composed bearing should always exist, as thus the confidence of the patient soon wins the sympathy which the face expresses or should express.

There is unquestionably, however, a class of persons who are either spiritually indifferent or negative, and over whom, therefore, no influence can be exerted; and in consequence of this belief the hypothesis exists, that persons are electrically charged either positively or negatively and that therefore affinity or repulsion exists among all persons; just to what degree this is true, we are unable to state, but all have observed the fact of the existence to a certain degree of such a condition. In cases of the kind where these pre-existing conditions are unfavorable, the dentist should exert as much will power as possible to overcome the

existing antipathy, and this can be done in most cases, with good success; there are persons, however, in whom the opposition to any influence is so marked, that both the patient and operator are obliged to suffer pain or fatigue, unavoidably. These are generally patients who soon seek another dentist.

Mesmeric influence is another but similar exhibition of spiritual power and consists of the ability of one person to transmit a portion of its spiritual substance—individuality, if you please, to another, in such a degree that pain may be produced or prevented at the option of the transmittor; those who are fortunate in possessing this power, undoubtedly exert a great deal of influence over their patients, especially is this true in operations of a painful nature and short duration, where by bodily contact the operator imbues the body of the patient for a short time with his own spirituality to such a degree that the feeling of pain is diminished. The physical body in its normal condition with the spiritual body also in its normal condition are so equalized that when both work in natural harmony, injury to any part of the sensibly known body is communicated by wires of transmission to the spiritual individual; that is, pain is a product capable of transmission the same as electricity, and when both bodies are normal the pain is felt, but if there is a super supply of spiritual substance, the pain is neutralized by that super supply of vital force and no pain is the result. The law of the correlation of forces is therefore true, not only so far as it is applied to physical bodies, but of spiritual bodies. The extinguishing of the pain then, is not annihilation but only transmission into another form, namely, into spiritual loss of the operator which is by him, if healthy, not perceived as much as the pain would have been by the patient because it is of a different nature, although the same in quantity. The same is the difference between worry and thought; and on the same principle that no force is lost, the illustration is familiar that a brick raised fifty feet retains just so much potential force as it required to raise it to that

height, it can exert that force by falling; the movement of the hour and minute hand and the friction of the wheels of the mechanism of a time-piece exactly equals the force exerted in winding the spring. Mesmerism has been known and applied extensively, especially on the Continent, in minor surgical operations including the extraction of teeth, in which latter operation it will be more extensively applied when mesmeric influence is more thoroughly and independently investigated and its true virtues made better known.

Though not strictly within the province of this paper perhaps it will not be entirely out of place to notice one other fact, namely, that although the Scriptures contain fifty-three different verses bearing upon the teeth, (a number of those are mere repetitions,) nearly all of them use the teeth merely for purposes of illustration the same as the eyes or hands. Job is credited with saying: "I escaped with the skin of my teeth," this sentence, if the literal meaning of the original Hebrew is correctly translated, expresses a truth, which only the present century demonstrated, Nasmyth having discovered the dental cuticle a thin epithelial membrane covering the enamel of the teeth and which is a continuation of the gum and the lining of the socket of the tooth, and in every sense appropriately called a skin, there is no question of its retention upon the teeth for some time after eruption, and indeed, it is but possible, that it may remain a lifetime.—*Dental Register*.

ARTICLE VI.

THE AMERICAN DENTAL ASSOCIATION.

WHERE SHALL THE NEXT MEETING BE HELD, CHICAGO OR
SAN FRANCISCO.

At an informal meeting in Buffalo, in December, at which six members of the Executive Committee were present, a vote was taken resulting in five for Chicago, one for

Buffalo. It was decided after the vote to leave the final decision and completion of arrangements with the Committee of Arrangements, they to be governed by circumstances in the final decision. Since more recently, a proposition to hold it in San Francisco has been made, it is deemed best to submit the question to the profession.

The reasons for going to California have already been so fully given in an article in the dental journals, and more recently in a circular letter, that it is unnecessary for me to take space to present them again. They read well and make us all feel like saying Go? *Why, of course!* But facts are hard things to knock against, and it will be found much easier for the majority of the dental profession to say to some other fellow, "Go!" than it will be to muster the money and spare the time to go himself. The rank and file of our profession are not rich men. The question of expense has to be considered by many.

A large per cent. are young men that need the meeting, and the Association needs them. How many will feel that they can spare the time and money necessary for so long a trip? Calculate a week to go, a week to return, the best of a week for the meeting, and two weeks to see California and the Great West, including points of interest on the route, and five weeks are gone. Fare from Chicago, round trip, \$62.50. Meals and sleeper about \$5.00 per day. Expenses \$5.00 per day at lowest estimate at a time when the city and surrounding country are thronged with the Grand Army and thousands of strangers. Add to this, extra railroad and steamboat fare for all side trips to points of interest, and the extras that you can never plan for, and it is easy to see by all who have traveled much that \$300 would be a *very* low estimate for the expense, besides at least five weeks of time. Those who have been to California all coincide in the statement that one can not see enough of California and the West to pay them for going without a greater expenditure of time and money than we have named. It is well known that July and August are

the most disagreeable months in which to make the trip to California, and we see the country at its worst. These are the months when Californians get away if they can. Since learning the desire of some that the American Dental Association should be held in San Francisco, the California Dental Societies have very courteously invited us, and we are sure their hospitality will be fully appreciated by all, but there are times when we can not afford to accept even hospitality. This is one. The association would lose too much. We could not hope for any large accession of new members, nor for the new ones gained to often met with us from so great a distance, and we should lose many.

Chicago was selected on account of its being central, easily accessible from all parts of the country at low railroad rates, and of its having unsurpassed hotel accommodations, and cool summers. The fact that a hundred of the new members elected last year were Western men and should be held, also entered into the decision. Your Committee have been quietly planning and working since the last meeting to insure at our next the largest attendance and most successful meeting ever yet held, feeling that each meeting should be an advance upon the one that precedes in points of numbers and interest; that we ought not only to hold the new members gained last year, but that we should add as many more at our coming session. It is too soon to complete definite railroad arrangements, but if the decision is for Chicago, we expect to bring them within the reach of all.

At a meeting of the Chicago members of the American Dental Association and of the Chicago Dental Society, called to ascertain the views of the profession here March 17th, the following Resolution was adopted by a vote of twenty-seven to five:

RESOLVED, That it is the sense and desire of this body that the next meeting of the American Dental Association should be held in Chicago, and that we extend to the Association a most cordial and hearty invitation to meet with us.

AN EXCURSION TO CALIFORNIA AFTER THE MEETING.

Your committee are assured by the railroad authorities that they can have equally as favorable rates in all respects for an excursion upon close of the meeting, if any considerable number wish to go to California, as are promised for the Association. The committee will see that *no pains are spared* to make such an excursion a success, if enough signify their wish to go to warrant making the arrangements. Thus, none who wish to go will be deprived of seeing California at the reduced rates while great numbers will not be deprived of attending the association because they can not afford a trip to California. It is a serious question whether the society has a right to hold its meetings beyond the reach of so large a class. Let us remember that our association is a scientific body intended to reach and benefit *the great body of the profession* as far as possible.

There has been so much discussion of the whole subject in the Committee and out, and the Committee are at such distances from each other that it is impossible to get a united expression of views *in time for the Journals*, as promised, hence, I submit this as an expression of a part of the Committee. Am very sure that each member of the Committee wishes to do only the very best thing for the Association, and to carry out the wishes of its members, and your votes will show us what those are and greatly facilitate the work of the Committee.

Please answer *promptly* by letter or postal the following questions:

In your judgment, should the meeting be held in Chicago or San Francisco?

Do you expect to attend the meeting if held in San Francisco?

Do you expect to attend the meeting if held in Chicago?

If the meeting is held in Chicago, will you probably go to California after the meeting is over, if an excursion is decided upon?

J. N. CROUSE, *Chairman Ex. Com. & Com. of Arr.*
2101 Michigan Ave., Chicago. Ill.

ARTICLE VII.

GAS FURNACES vs. COAL OR COKE.

BY H. C. LAND.

That the gas furnace for dental operations is destined to supercede the coal or coke there can be no doubt. To get rid of the disagreeable features, such as the handling of coal or coke, the dirty ashes, etc., add to this the much greater loss of time in accomplishing the same results as well as the uncertainty of success that may arise for want of a better draft, poor coal or coke, and the unfavorable condition of the weather. To say that the gas furnace is absolutely free from all the above objections, is a valuable count in its favor, and to add that it will produce superior results in less time with unerring precision is all that could be desired. Heretofore the serious trouble with gas furnaces has been the liability to injure the color of the body and enamel. After a long and careful series of experiments, I have at last discovered the secret of the trouble, and in a very simple and practical way have entirely overcome them. Therefore it is with much pleasure I now deem it my privilege to announce to the profession the technical reasons. In the use of the various hydrocarbons which are at our command olefiant gas $C_2 H_4$, gasoline $C_2 H_4$, are the most available, from which we must secure the necessary degree of heat. The philosophy of the combustion of these two substances may be illustrated in the following manner: Draw three parallel lines, an inch apart, one above the other, this will represent the interior of the furnace, estimate the burners as being set one inch beneath. The first line will represent the bottom of the muffle, the next line one inch higher on the outside of the muffle, and the third line the top of the muffle. We have here 1st, 2nd, and 3d stages of combustion. In the inch below the muffle one atom of oxygen is taken up,

producing di-oxide of carbon ; in the next stage two atoms of oxygen unite, producing mon-oxide of carbon, and in the third and last stage, three atoms of oxygen are taken up producing carbonic acid, this is perfect combustion. Now, if we take into consideration the fact that in order to secure 2,800 degrees of heat it is necessary to have a bellows that will supply a constant blast of one pound pressure to the square inch, it becomes evident that this force is capable of driving the di-oxide of carbon completely through the pores of the muffle, especially when it is driven directly against the bottom, this product enters the body and remains in it, and as it takes about 2,800 degree to eliminate di-oxide of carbon—the biscuiting being completed at a much lower degree—therefore, when the case is subjected to a degree of heat sufficient for enameling, this di-oxide or it may be mon-oxide of carbon, comes out in the shape of numerous small bubbles, this is what we call gasing the teeth. To overcome this difficulty my first step was to force a current of heated air into the muffle and in this manner drive the di-oxide of carbon out. This was successful in a degree, but I soon discovered that too much air from the excess of oxygen would also bleach the enamel. I then secured an atmosphere of pure nitrogen and injected this into the muffle, it being a neutral gas, this was eminently successful and demonstrated the fact that porcelain baked in an atmosphere of pure nitrogen is absolutely perfect. The next step was to secure the nitrogen in some simple way, this has been accomplished and gives no additional cost or trouble to the furnace. To those who wish to see practical demonstrations they are welcome to my laboratory at Detroit, or in due time shall be able to give practical demonstrations before the dental associations. The advantage to be able to step into one's laboratory and within the space of from fifteen to twenty-minutes bake a set of porcelain teeth, or it may be to bake a porcelain crown fast to a platinum tube that is intended to cap over a root, cannot be over-estimated. A lady called at my office with her seventeen-year-old

daughter, both the superior lateral incisors were not more than one-third their proper size, and in contrast with the other well developed teeth were a disfigurement. To remedy this trouble, two platinum tubes were fitted over the teeth; the next step was to take two ordinary plate teeth and grind them to mere shells, this secured the size and color, then they were baked to the tubes by using a little fresh tooth body, the result was a complete success, the joint at the margin of the gum could not be seen. The subject of this circumstance tells her schoolmates that her teeth have overcoats on.

The next experiment will be some porcelain and platinum bridgework by stamping the cusps of molars and bicuspid, then fill them with body and bake, then solder them on to the bridge work, After this is done take the ordinary plate teeth, grind the crowns down so that they are level, then fit them to the bridge-work, the whole can then be placed in the furnace and by previously filling all the interstices between the teeth and the platinum crowns a most beautiful piece of bridge-work can be secured. My object in presenting these cases is to awaken the profession to the fact of the dawn of a new and brilliant future for dental prosthesis.—*Dental Register*.

628 W. Lake St., CHICAGO, ILL., March 3d, 1886.

Editor of AMERICAN JOURNAL OF DENTAL SCIENCE:

Dear Sir.—The following resolution was adopted at the January meeting of the Chicago Dental Society and the Corresponding Secretary instructed to transmit a copy to your Journal for publication.

RESOLVED, That this Society endorse the action of the conference at Buffalo, as regards the International Medical Congress.

(The action is embodied in the following resolution:)

RESOLVED, That we as members of the dental profession deem it inexpedient to recommend the organization of a Section of Dental and Oral Surgery in the International Medical Congress of 1887 under the present circumstances.

P. J. KESTER, *Cor. Sec.* Chicago Dental Society.

ILLINOIS STATE DENTAL SOCIETY.

The twenty-second annual meeting will be held at Rock Island, Ill., beginning Tuesday, May 11th, and continuing four days. Dentists in this and adjoining States are cordially invited to attend.

J. W. WASSAL, *Secretary*,
208 Dearborn Ave., Chicago, Ill.

Editorial, Etc.

ANNUAL COMMENCEMENT OF THE DENTAL DEPARTMENT OF THE UNIVERSITY OF MARYLAND.—The Annual Commencement of the University of Maryland, Dental Department, in connection with the seventy-ninth Annual Session of the University School of Medicine, was held at the Academy of Music, Baltimore, on Wednesday, March 17th, 1886. The reading of the mandamus and the announcement of the Graduates by Professor Ferdinand J. S. Gorgas, Dean. The degree of D. D. S., was conferred by Hon. S. Teackle Wallis, L. L. D., Provost of the University, upon the following gentlemen, all of whom had attended two full sessions of five months each in separate years:

Amend, Emil	- - - -	Germany
Baden, Frank A.	- - - -	Maryland
Basehore, Horace E.	- - - -	Pennsylvania
Brueille, Emile	- - - -	France
Bookhart, Thomas W.	- - - -	South Carolina
Bruce, William W.	- - - -	West Virginia
Campbell, Oscar J.	- - - -	Virginia
Chafee, Augustus H.	- - - -	South Carolina
Diehl, John S.	- - - -	Pennsylvania
Emerson, Joseph G.	- - - -	Brazil, S. Am
Furman, Charles Luff	- - - -	New York

Gasque, Elly A.	-	-	-	South Carolina
Greenawalt, D. D. S., A. H.				Pennsylvania
Hartwig, Charles W.	-	-	-	Maryland
Hoffman, John H.	-	-	-	Virginia
Huggins, G. Allen	-	-	-	South Carolina
Lowell, William H.	-	-	-	Pennsylvania
Lumsden, Frank H.	-	-	-	Maryland
Macgill Jr., Lloyd T.	-	-	-	Maryland
Pleasants, Wilfred A.	-	-	-	Virginia
Proctor, Jr., W. Eppes	-	-	-	Virginia
Purnell, Ralph C.	-	-	-	Maryland
Riley, James M.	-	-	-	North Carolina
Shields, Lewis N.	-	-	-	Texas
Sims, Benjamin F.	-	-	-	South Carolina
Slocum, Frank E.	-	-	-	New York
Wall, Joseph A.	-	-	-	Pennsylvania

The University Prize, Gold Medal, for the highest number of votes at the final examination, was awarded to William E. Proctor, Jr., of Virginia. Honorable mention was awarded to Wilfred A. Pleasants, of Virginia.

The Address to the Graduates was delivered by Col. William Allen, President of McDonough Institute.

The number of Matriculates for the Session of 1885-86, was *ninety-one*.

Although the number of Matriculates for the Session was larger than ever before, the number of graduates is smaller, on account of a strict compliance with the *two session rule*, as a requisite for graduation, no less than *twenty-two* having been refused, who desired to graduate in one session, on 5 years or more of practice.

The annual meeting of the Alumni Association of the Dental Department, University of Maryland, was held at the Howard House, Thursday evening, March 18th. Dr. Charles L. Steel, of Virginia, presided. Prof. F. J. S. Gorgas addressed the meeting. Members of class of 1886 and a number of the graduates of other colleges were elected members. The following officers were elected for ensuing year: President, Dr. R. D. Dodson, Pennsylvania; vice-president, Dr. J. Fournien, N. Y.; secretary, Dr. J. S. Kloeber, of Virginia; treasurer, Dr.

J. H. Davis, of Maryland. A banquet followed. Many speeches were made.

The contest for prizes by members of the graduating class of the Dental Department of the University of Maryland took place Saturday, March 13th, 1886. The judges consisted of a number of prominent dental practitioners from Maine, Virginia, Pennsylvania, District of Columbia, North Carolina, Maryland, New Jersey, West Virginia and other States, who came to Baltimore for the purpose. The prizes were awarded for practical work in the infirmary and laboratory, and are as follows :

1. S. S. White prize, dental engine, for best full upper set of gum teeth on metal base, to W. H. Lowell, of Pennsylvania ; honorable mention, J. H. Hoffman.
2. Snowden & Cowman prize, set of C. A. Harris' forceps, for best partial set of five or more teeth on metal base, to W. H. Lowell ; honorable mention, L. N. Shields.
3. S. S. White prize, set of Varney's pluggers, for best two fillings of cohesive and non-cohesive gold, to E. Brugeille ; honorable mention, L. N. Shields.
4. Dr. T. L. Wood prize, gold medal, for best contour gold filling, to W. H. Lowell ; honorable mention, E. A. Gasque.
5. Dr. N. T. Shield prize, gold medal, for best filling of non-cohesive and cohesive gold combined, to W. A. Pleasants ; honorable mention, W. E. Proctor, Jr.
6. Dr. Jas. H. Harris prize, gold medal, for best filling of Abbey's non-cohesive gold, to J. G. Emerson ; honorable mention, C. L. Furman.
7. Dr. F. J. S. Gorgas prize, second edition of Gorgas' Dental Medicine, for best combination set of metal and either vulcanite or celluloid, with soldered rim, to W. W. Bruce ; honorable mention, H. E. Basehore.
8. Dr. B. H. Catching prize, one year's subscription to *Southern Dental Journal*, best examination on dental materia medica and therapeutics, to W. E. Proctor, Jr.
9. Dr. J. Uhler prize, gold medal, best set of teeth of continuous gum, to E. Brugeille ; honorable mention, John H. Hoffman.
10. Dr. C. L. Steel prize, gold medal, best specimen tooth filling, W. H. Lowell.

THE INTERNATIONAL MEDICAL CONGRESS.

In answer to a query from a physician in Paris, as to whether the International Medical Congress will be held in this country in 1887, the *Medical Record*, January 9th, says "If we were to give to the foregoing inquiry an answer unreservedly in the affirmative, we should be misrepresenting matters to our Parisian confreres. It is announced, positively and officially, that there is to be an International Medical Congress, but we must add to this that the American profession is seriously divided over the matter of its management, and that a considerable part of the best men of the profession have been excluded or have been forced, in self-respect, to withdraw from all connection with it.

"We are glad to state, however, that efforts for a compromise are now being made, and that there are a number of prominent gentlemen in this city, who have heretofore held aloof from the Congress, who are willing to join hands with the present management if such concessions are made as will enable them to do this properly.

"We shall be able, probably in a fortnight, to say whether these hoped-for arrangements have been made, and we shall make the announcement to our French confreres at that time.

"If they are not made, and the present dissensions and disarrangements continue, we cannot conscientiously advise foreign physicians to come over here."

While we regret to be compelled to do so, we can only characterize the above as a wilful and deliberate effort on the part of our contemporaries to injure the Congress, because a few distinguished leaders in some of our eastern cities so desire.

We most emphatically say, that "*a considerable part of the profession have*" NOT "*been excluded*;" those who are out in the cold are there because they choose to be—they resigned the positions to which they had been appointed, solely because they found themselves unable to control the American Medical Association, and through it the Congress.

Rather than suffer themselves to be left out, they are willing to let the impression go abroad, that the Congress is doomed to failure.

We are satisfied that these gentlemen resigned their positions under a misapprehension; it was supposed that the American Medical Association would be unable to stand their defection, and would alter its whole course rather than do without them.

But it was forgotten that times had changed since Philadelphia, New York and Boston ruled medical America; the fact was overlooked that we have a great West and a great South, and that while the whole medical world is ever ready to pay all due respect to the Eastern magnates, it is not as ready as it was to be controlled by them.

Away back in the twenties, when a few men sought to control the medical profession of England, after a while the rank and file revolted, and the warfare waxed so high that on one occasion the elder Mr. Wakeley, the champion of the masses, was *forcibly* ejected from the theatre of the College of Physicians (of which he was a member in good standing) by order of the Council.

While we have not yet come to such a pass in this country, and it is to be hoped we never shall, yet the position is somewhat similar.

A few leaders are endeavoring to autocratically govern the mass of the profession, and, apparently, stand ready to endeavor to ruin that which they cannot rule.

In the meantime, the regularly-authorized Committee of the American Medical Association are going steadily forward-making arrangements for the Congress that *will be held in Washington in 1887*.

This committee is the agent of the American Medical Association; and right here we wish to say most emphatically and most clearly, *that we have no sympathy with nor support for any committee, or any set of men, as a committee or set of men*, BUT WE DO MOST POSITIVELY ASSERT THAT EVERY TRUE PHYSICIAN UNQUESTIONABLY OWES HIS ALLEGIANCE TO THE AMERICAN MEDICAL ASSOCIATION, and is in honor bound to abide by, aid, and support its decisions.

The Congress is being organized under its auspices and direction hence every man who believes in subserviency to law and order must give his support to this organization.

If the Association at any time sees fit to reconsider its action; if it modifies or changes in toto its present attitude, such change will receive our most cordial support, as it should that of every right-minded man.

Let it be but clearly understood that the question is not that of supporting one or the other party, but of supporting or rebelling against the power of the American Medical Association; let it be realized that, unfortunately, many of our leaders are on the side of opposition; let it be appreciated that their attitude is much like that of minority leaders in South American republics, who would rather ruin than be governed by those who are distasteful to them; let these points be clearly understood, and the whole matter is plain.

There can be no two sides to this question. On the one hand are arrayed those who would support the American Medical Association; on the other, those who would crush it because it will not do their bidding.

Next spring will decide who are in the majority.

In the meantime, let us again most positively state that the Congress will be held, and will be well worthy of attendance.

We say amen to every word of the above editorial from the *Medical and Surgical Reporter*, of Philadelphia, one of the very foremost weekly journals of this country. The wording can be easily changed so as to apply to a lot of disgruntled dentists who are endeavoring to throttle the movements of President Taft in organizing the Oral and Dental Section.

—*Dr. B. H. Catching.*

Monthly Summary.

CAPSICUM BAGS.—*Dr. Ingersoll.*—The origin of this appliance was, I believe, with a young lady who had acquired the art of facial expression by gum-chewing. She knew that mustard was a good thing to relieve pains, and wanted to try the

application of mustard to an aching tooth. She took a piece of chewing-gum, and made it like the bowl of a spoon, then, putting the mustard in it, she placed the gum back in her mouth, and pressed it down over the deceased part; now she had a mustard plaster applied to the tooth. From that I believe, originated the capsicum bag, one side of which is linen, the other oiled silk. They are filled with capsicum, or capsicum and ginger, and are applied without danger of vesicating. I tried these, and found that they moved about from place to place, and would not bring about the desired results. Then—I do not know where I got the idea, but it was from somebody wise enough to know what to do. I wish I could remember, to give the man credit for it. It is this: I take the extract of capsicum—I do not like the tincture, it is too alcoholic—the extract is more aqueous; I take the very heaviest bibulous paper, after having examined to see what size I want; I tear a piece off—I prefer to tear it; if you cut it with scissors, the edge will be stiff and hard; If it is torn off, it leaves a feathery edge, and the movement of the cheek will not so readily move it out of place. Take a piece of cotton and dip it in the extract of capsicum, and with it saturate one side of the bibulous paper; then turn it over, and cover the other side with thick sandarac varnish—as thick as cream. This apply to the tooth, the varnished side toward the cheek. I hold it there until the saliva has saturated it so to retain it. In that condition it will adhere quite closely to the gum; the outside being covered with gum sandarac, it does not affect the mucous membrane of the cheek. This plan I have found to operate more surely than anything else. Capsicum is the most powerful of stimulents, as well as the most persistent; almost any other will lose its power in an hour, but this will continue for hours as pungent and as active as ever. It is a most persistent irritant. It promotes circulation; and nature, in these cases, aided by this stimulant, is frequently able to carry off formed pus and effect a cure

TO MEND A BROKEN FILE.—Take a file as soon as it is broken, and wet the break with zinc dissolved in muriatic acid, and then tin over with the soldering iron. This must be done

immediately, as soon as the file is broken, as the break begins to oxidize when exposed to the air, and in an hour or two will gather sufficient to make it impossible for the parts to adhere. Heat the file as warm as it will bear without disturbing its temper as soon as well tinned, and press the two pieces firmly together, squeezing out nearly all the solder, and hold in place till the file cools. This can be done with very little to trim off, and every portion of the break fitting accurately in place. Bring both pieces in line with each other, and, for a file, it is as strong in one place as in another. and is all that could be asked for under the very best of welding treatment.—*Popular Science News*.

GLYCERINE IN DRYNESS OF THE TONGUE.—The annoying dryness of the tongue and pharynx, so common in acute febrile diseases, according to Cotter, may be relieved by brushing pure and undiluted glycerine over the affected parts. The great thirst ceases, and the patient's condition is made more comfortable. It is probable that glycerine stimulates the secretion of the salivary glands, and thus acts as a solvent for inspissated material accumulating upon the buccal mucous membrane in cases of this kind.

PRESERVATION OF COCAINE SOLUTIONS.—Cocaine is well known to be liable, when in solution, to be altered by the growth of microscopic fungi, so as to produce severe local inflammatory symptoms. Dr. Squibb, of Brooklyn, after trying various agents to prevent this change, finds that salicylic acid answers best for the purpose. This is added to the alkaloidal salt in the proportion of one six-hundredth part, this quantity being sufficient to protect the solution indefinitely. Salicylic acid is soluble in about three hundred parts of water: and it is advantageous to keep the solution ready-made, and use half of water and half of solution of salicylic acid, for the purpose of dissolving the cocaine salt.

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ARTICLE I.

NEW EXPERIMENTS AND OBSERVATIONS ON
HYDROBROMIC ETHER OR THE BROMIDE
OF ETHYL AS AN ANÆSTHETIC.*

BY LAURENCE TURNBULL, M. D., PH. G.

(Aural Surgeon to Jefferson Medical College Hospital; Physician to the
Department of Diseases of the Eye and Ear, Howard Hospital,
Philadelphia.)

The hydrobromic ether or bromide of ethyl was discovered by Serullas, in 1827, but received no special attention until Dr. Thomas Nunnelly, of Leeds, reported some experiments made with it on animals in 1849. Dr. Nunnelly brought the subject again before the profession, by a paper read at the meeting of the British Medical Association in 1865, in which, speaking of it in conjunction with another anæsthetic, he said he had for some time employed the one or the other in all the principal operations at the

*Reprinted, with additions and corrections, from the *Journal of the American Medical Association*, November 21, 1885.

Leeds General Eye and Ear Infirmary. This was at a time when chloroform held such complete sway in England, that no importance was attached to Nunnelly's experience or experiments. He had no one to follow him in using it; and we hear no more of it until 1876, when some experiments were made with it in France, by Rabuteau, on the lower animals; but evidently without a knowledge of the fact that this had been done previously in England by Nunnelly.

I then took the agent up without the knowledge of the experiments of Dr. Nunnelly. I had it made in Philadelphia by Professor Remington, and with two friends began experimenting in September, 1877; using it first on myself, and then upon my patients. When pure, bromide of ethyl is a volatile, colorless and almost unflammable liquid, contrasting favorably in this respect with sulphuric ether, the highly inflammable and explosive properties of which are well known. It has a hot, but saccharine, taste; its specific gravity is 1.42, and it boils at 105.8° Fahrenheit. Its boiling point and density are therefore intermediate between those of chloroform and ether. After satisfying myself as to its efficiency and safety as an anæsthetic by experiments upon myself and others, I laid the subject before the Pennsylvania State Medical Society in 1878, and a record of ten cases, with my conclusions, was published in the volume of their transactions for that year. In August, 1879, I brought it before the British Medical Association at Cork; and in September of the same year, I presented a report of one hundred cases before the International Medical Congress at Amsterdam, to which I was a delegate from the American Medical Association. Up to March, 1879, when the second edition of my work on anæsthetics went to press, I had published a report of one hundred and twenty-five successful cases in quite a variety of surgical operations, and had not only employed it at my daily ear clinic, but also in the Jefferson Medical College Hospital; and I administered it in April, 1879, to a patient

of Dr. Samuel W. Gross, at the public clinic, when he (Dr. Gross) removed a hyoid cyst from in front of the neck of a child. Dr. R. J. Levis, who was at this clinic, for the first time saw it employed, and became much interested in its use.

I thus compelled chemists to make it, by producing a demand for it; and gave them, through Dr. Green, a good formula for obtaining it free from impurities. I induced surgeons all over the country to try it, and especially the surgeons of this city, by^o bringing it in every way before their attention. The whole number of cases in which it has been employed by myself and friends was, up to June, 1880, some eight or nine hundred.

I cannot but feel disappointed that two deaths, not produced by it, should have been associated with it,* as advantage will be taken of such accidents by those having a prejudice against the ether, to condemn it on theoretical grounds.† In several instances recently the use of this anæsthetic has been attended with persistent vomiting, though in the thousands of cases in which it has been

*The bromide of ethyl as an anæsthetic, by Marion Sims, M. D., L. D., *New York Medical Record*, April 3, 1880.

†In the discussion following the report of the fatal case by Dr. Sims to the New York Medical Society, Dr. Squibb undertook to account for the poisonous effects of bromide of ethyl by assuming it to be a loosely molecular article, easily decomposed; that thus its administration is prone to be followed by an impregnation of the system with bromine; and that if it remained as bromide of ethyl in the system it might not be harmful. This theory has been shown to be based on insufficient grounds. In the first place, Professor Jungk has shown that bromide is not "a loosely molecular article;" that in fact it is a very stable salt [for a salt it really is,] and very difficult of decomposition: much more difficult than chloroform. In the second place, the assumption that anæsthesia is due to a breaking up of the anæsthetic into its elements is nothing more than a hypothesis, and one, too, which has little or nothing to support it. The fact that one of the characteristics of bromide of ethyl is that it is perfectly unirritating to the bronchi, goes to show that it is not decomposed; if it were, the bromine in its composition, one of the most irritant of substances, would certainly manifest itself in its effects on the air passages.

employed, chiefly in Philadelphia, in not one single instance has it caused cerebral trouble, or any of the symptoms produced by the action of free bromine, which are as follows: when dogs are confined in an atmosphere of bromine vapor, they suffer a profuse secretion from the eyes, nostrils and fauces, with cough, hoarseness and dyspnœa. I have experimented upon frogs, cats, dogs, rabbits and various other animals, by subjecting them to an atmosphere highly charged with the vapor of hydrobromic ether, and in rare instances were there the effects as described above.

In the case of death under the employment of this agent in the hands of Dr. Levis, we do not think he was doing justice to it in subjecting the new anæsthetic to this most severe test. He knew the extreme debility of the patient, and that the most simple nervous shock would render him liable to death. Hundreds of patients have thus died. Again, when ordinary ether, chloroform, or other anæsthetics cause fainting; which was no doubt the result in this case, artificial respiration must be resorted to. We are reliably informed that in this instance the movement of the chest walls forced *the pus which was in this man's lungs into his bronchial tubes and suffocated him.* We are also very sorry that the valuable agent, nitrite of amyl, which has been found useful in such cases, was not employed.

The following report of the case will be of interest:

“PHILADELPHIA, June 2, 1880.

“Deputy Coroner Beam made an investigation of the circumstances, as reported in *The Times*, of the death of William Linderman, eighteen years old, of Schuylkill county, while upon the operating table at the Jefferson College Hospital under the influence of the new anæsthetic, bromide of ethyl, and about to be treated for stone in the bladder. He had been for about sixteen weeks under the care of Dr. R. J. Levis, one of the strongest advocates of

the new anæsthetic, and was taken to the hospital by his direction. Linderman's health was very poor at the time. Dr. Ames, who administered the bromide, said an incision had not yet been made, but Dr. John B. Roberts said that there had. The patient was in such a condition that something had to be done, because he could not tide over the hot weather—96° to 98° in the shade.

"Dr. J. G. Lee, the coroner's physician, testified that he found the brain congested, *the lungs far advanced in consumption, and the kidneys and liver enlarged* and two large encysted stones in the bladder. His opinion was that they could not have been safely taken out. *Linderman could not have lived over a week or two at any rate.* Dr. Lee said further, that he had experimented with the bromide on animals without bad results. In his opinion death resulted from exhaustion and prostration, the results of phthisis. The jury took the same view in their verdict."

As is well observed by Dr. Henry M. Lyman, "All experience shows that the administration of anæsthetics to certain patients is attended with danger. Even sulphuric ether may prove fatal if the kidneys are seriously damaged, and pulmonary disorganization is a well-known source of danger during the inhalation of anæsthetic vapor. The administration of chloroform to such a patient would be a very hazardous undertaking. The fatal results in these cases cannot be charged against the particular anæsthetic employed, but rather against the exhibition of any anæsthetic agent whatever."*

In some recent experiments on animals, I crowded four ounces (the quantity stated to have been used by Dr. Sims,) upon a dog by means of a tin inhaler, until he became apparently dead, with no perceptible action of the heart or lungs; but the expression of his eye was clear, and the pupil was dilated; while there was no secretion from

*"Artificial Anæsthesia and Anæsthetics." Pages 220, 221.

the eyes or nostrils. The apparatus was removed in the space of four minutes, and he was exposed to the air, when at once he began to breathe, and by the end of six minutes, he had almost entirely recovered consciousness. The dog did not seem much inclined to move for ten or twelve minutes afterwards. While this dog was only partially under the influence of this anæsthetic, having at first caught the inhaling apparatus between his teeth, there was a good deal of rigidity, and slight tetanic movements of the extremities, but this was overcome by the free use of the ether.

Now, had we been using chloroform, just before we would have been ready to perform any experiments upon the animal, he would have been dead; and neither the removal of the anæsthetic nor exposure to air, would have been of any avail. Again, if Squibb's rectified and absolute ether had been employed, we must have super-saturated the animal, and been annoyed by the expectoration of large quantities of mucus, which in one recent experiment by me was followed by death. Then we frequently have seen tetanic convulsions, with great reduction of temperature, requiring several assistants to hold the patient, from the use of ordinary ether. The rapidity of the anæsthetic action of hydrobromic ether and its rapid elimination from the system by the lungs, are two of its chief merits for all operations that are not prolonged. *We recommend pure hydrobromic ether in operations not lasting over forty minutes.* For operations lasting one or two hours, we would advise the additional use of sulphuric ether; commencing after thirty or forty minutes' exhibition of the bromide of ethyl.

There is one great advantage in the use of this agent, that the administrator must attend to the anæsthetic all the time; he cannot watch the operation and forget the patient for a few seconds; his whole attention must be given to keep up its action. We believe that patients have sometimes been stifled by close pressure of the napkin, wet with the water present in ordinary ether, by the careless-

ness of the person giving it; whose attention has been given to the operation, rather than the patient.

As an anæsthetic in labor it has peculiar advantages, in that it is so rapid in its effects; the patient is comforted between the pains, but never passes into such a state of profound anæsthesia that she is not aroused by the expulsive effort, and has all her consciousness about her; and there are none of the depressing effects of ether or chloroform. It is also most valuable in these cases when it becomes necessary to change the position of the child; also in bringing forward the neck of the uterus into its proper position.* In none of my cases was there disturbance of the bowels, or pain in the back or head.

Miller, of Berne, speaks well of this obstetrical anæsthetic, which he has used in sixteen cases of primiparæ and six of multiparæ. Reddening of the face and acceleration of the pulse were frequently noted, thus giving the assurance that cerebral anæmia, as in the chloroform-syncope, need not be feared. The peculiar analgesic virtues were gratefully commented upon, especially by multiparæ. Hæckermann and Parnemann (Schmidt's Jahrbuecher No. 12, 1884,) express themselves in equally eulogistic terms of the anæsthetic in confinements.

To the country practitioner, who is obliged to extract teeth or perform any of the minor operations in surgery, it is a great boon, as it acts like nitrous oxide gas. It is well where a number of teeth are to be extracted, that a prop of hard wood attached to a string should be used; so as to prevent such an accident as once occurred in Philadelphia under the use of nitrous oxide gas: the swallowing of a prop of cork. It frequently happens in the use of hydrobromic ether, that when narcotism is not very profound, that the muscles of the patient become rigidly contracted. This condition occurred in a recent case, when we adminis-

*See pamphlet on the "Bromide of Ethyl as an Anæsthetic in Labor," by E. E. Montgomery, 12 pp. New York: W. Wood & Co., 1885.

tered $\frac{3}{4}$ of this anæsthetic; the operator's finger was caught and pinched, as also his forceps; and yet before operating we could touch the cornea with impunity. Although the impression passed away very rapidly, twelve teeth were extracted with entire success, the patient not feeling the pain, and promptly recovering consciousness.

In the following case the patient went under it very kindly. The patient was a man of very nervous temperament. With three drachms of hydrobromic ether, anæsthesia was produced without any struggling; and in four minutes from the time he had commenced to inhale it, the dentist had extracted ten teeth, and he had fully recovered consciousness, and without nausea; although he had just eaten a breakfast of solid food.

In a recent case of cataract extraction, the patient went beautifully under the influence of the anæsthetic, extraction was accomplished, and the patient recovered so as to be able to count fingers, yet owing to some strong coffee which she drank, from dyspeptic symptoms, or the swallowing of water soon after the operation, she became very sick at her stomach, and vomited for almost twenty-four hours; and yet the case did well. In a case of operation for torticollis, for a woman, she swallowed so much air with the ether, that as a consequence she complained of pain of a hysterical character, in lower part of the abdomen; the same which is often the result when nitrous oxide gas is inhaled, and too much air admitted.

In a letter received from the late Dr. J. Patterson Cassells, of Glasgow, a distinguished aurist and a surgeon to the celebrated Glasgow Infirmary, he writes that he has used a specimen of the hydrobromic ether, which I gave him at Cork, as vapor, in diseases of the middle ear, and has also employed it as an anæsthetic with success.

As I have before stated,* "*no anæsthetic can be used*

*See "A Presumable Ether-Death from Heart Failure," by John B. Roberts, M. D., *Medical News*, September 27, 1884; by the same author, "Ether-Death," *Medical Times*, June 4, 1881. "Case of Death following the Inhalation of Chloroform," reported by P. L. Helsman, M. D., Albany [Ga.] *Medical News*, September 27, 1884.

with absolute safety:" all will kill. Chloroform kills, in round numbers, about one in every three thousand. Pure ether† is, next to nitrous oxide, the safest anæsthetic; only seventeen cases of death, and many of these doubtful, having been reported from its use. But it requires boldness and freedom in its administration; if slowly or ineffectually administered it is apt to produce a free secretion of bronchial mucus, which occasions troublesome coughing. If nitrous oxide is administered alone as a prelude to ether, the secretion of mucus is less troublesome, but there is a great amount of venous congestion and the tissues become gorged with blood, so that every incision tends to bleed. At times, also, wild excitement is produced by the gas. Some surgeons use the mixture which is known as A. C. E., which contains one part by measure of absolute alcohol; two of chloroform and three of Squibb's ether. This is not simply a mixture; the absolute alcohol,* 99.4 per cent., causes a solution of the other two, and they evaporate together. But the mixture should be administered freely from a cone of felt or flannel, with a paper covering, and the desired effect should be produced as rapidly as possible. The best results are by the agents which produce rapid effects, and which are as rapidly recovered from. No other has produced such rapid anæsthesia as the hydrobromic ether, and it is the most rapidly recovered from.

There are certain conditions of the system which forbid the use of anæsthetics. Again, there are certain of this class of agents that should not be employed in prolonged operations, as, for instance, the "bichloride of methylene," bichloride of ethedene, and bromide of ethyl. One or two deaths have followed the improper use of each of these agents, even when recommended by a committee appointed by the British Medical Association and by Sir

†Ether fortior, liquid, 94 per cent. of oxide ethyl, 6 per cent. of alcohol, and a little water.

*Specific gravity, .0716, at 77 deg., F.

Spencer Wells.† As the result of the observations and experiments with the bromide of ethyl, my conclusions have been that one hour is the longest time that a patient can remain under the influence of this anæsthetic with safety. In the case of potent remedies like morphine, atropine, hydrocyanic acid, etc., no one will attempt to ignore, or refuse to use such valuable remedies because in certain individuals and under certain conditions of the system, they produce death.

Can we in all cases rely on the experiments on animals as a true and absolute guide to determine our course in the human being? We think not; for it is a well-known fact that many animals eat plants which are deadly poisons to man, and certain anæsthetics are fatal to dogs.‡ Again, certain salts taken with impunity by man are poisonous to animals. The results of the prolonged experimental use of anæsthetics in the laboratory, even when of two hours'§ duration, cannot be taken as unquestioned as the results obtained by numerous careful observers on themselves and others. Clinical experience has now reached at least two thousand|| well authenticated cases in which the bromide of ethyl has been employed with safety since 1880, when the two deaths were reported.

The following trials of this new anæsthetic were made to test its merits and to obtain personal experience of its

†Turnbull on "Artificial Anæsthesia," second edition, 1879.

Messrs. Regnaud and Villejean [*Lancet*, July 6, 1884.] have confirmed my statements [see page 65 of the last edition of my work,] that the so-called "chloride of methylene" is a mixture of chloroform and methylic alcohol.

‡Dr. B. A. Watson, Jersey City. "An Experimental Study of Anæsthetics." *Medical News*, p. 313, May, 1878. Method not given.

§"Two New Anæsthetics," by J. C. Reeve, M. D., Dayton, Ohio. *Cincinnati Lancet and Clinic*.

||Dr. Chisholm, of Baltimore. *Maryland Med. Jour.*, January, 1883. Dr. Prince, of Jacksonville. *St. Louis Med. and Surg Jour.*, October, 1888, and Dr. L. Turnbull, of Philadelphia. *Medical Bulletin*, June, 1880.

effects. They were made by a gentleman very familiar with all the other anæsthetics, and his experience should be worthy of confidence. For the record of occurrences after loss of consciousness, and for care and attention during administration, he was indebted to his friends, Drs. Pilate and Conklin:

First Experiment.—March 14th. Four hours after eating a moderate breakfast he proceeded to inhale the bromide of ethyl, in the recumbent position; and from a bottle just opened, labeled "1 oz. bromide ethyl," about one-fourth of the contents was poured into an Allis ether inhaler. The first and immediate sensations upon inhaling it were a sharp pungent impression on the air passages, a sense of warmth rapidly extending, and exhilaration. With the second inspiration he felt a decided influence upon the brain, and began to talk; anxious to continue speaking as long as possible, and to state his sensations. A rapid beating in the ears is a constant symptom with him in taking chloroform, and immediately precedes entire loss of consciousness. He marked its presence now, and also its early appearance. It could not have been later than the third, or possibly the fourth, inspiration when he noted it, and this, as with chloroform, was the last sensation.

Upon opening his eyes after recovery from the anæsthetic, he immediately collected himself and could remember all; could talk clearly, and had no confusion of thought. He felt a slight sense of nausea and a feeling of languor. Eight minutes afterwards he got up and walked about without dizziness, and was confident he could have done so sooner. He did not attempt it sooner because he felt that sickness would ensue if he arose. The feeling of nausea remained until he commenced eating his next meal, about forty minutes later,

Second Experiment.—Pulse at beginning, 80; he having just ascended a flight of stairs. Two drachms administered. Symptoms began to be manifested after two respir-

ations. Spoke of general warmth, pleasant sensations and beating in the ears. Anæsthesia produced in one minute and a quarter; in another quarter minute it was profound, as tested by a knife point. Pulse during the first minute ran up to nearly 100, then fell during the next minute to about 70, feeble and intermittent. Pupils unchanged; normal; no struggling or excitement, but tetanic clutching of the inhaler so that it could be gotten away only with difficulty.* The anæsthesia lasted one minute and a half. He then awakened without mental confusion. Pulse seven to eight minutes later, 64. He was not satisfied with this experiment, particularly in regard to the irregularity and intermittence of the pulse: not a very assuring symptom in anæsthesia, and a result not agreeing with other observations. He had a suspicion from this fact, and from the nausea, that the specimen used was not pure. The bottle bore the name of a house which is always a guarantee of the good quality of medicines; but in the early period of manufacture of a new article, it would not be surprising if perfection was not immediately attained; he therefore obtained another specimen,* and one week after the above trial again inhaled it.

Third Experiment.—Being in the recumbent position, four hours after eating, one drachm, by measure, was poured into Allis' inhaler. He tried to take it slower this time, and count the respirations aloud to mark when conscious action ceased. He immediately felt the same grateful and pervading glow of warmth all over the body; counted to the seventh respiration; beating in the ears was again the last recognized impression. Pulse before, 80; at the end of the first minute, 120; one and a half minutes, at the rate of 100; at the end of two minutes, 78, no irregularity or intermittence; pupils unaffected; totally unconscious in one minute. Consciousness returned in three minutes.

It was his design to push the inhalation further this

* From the house of John Wyeth & Bro., Philadelphia.

time, and to test the muscular relaxation as well as to decide in regard to the irregularity of the pulse. Feeling that this had not been done, after about fifteen minutes he took it again.

Fourth Experiment.—Two measured drachms were poured on the inhaler, and he placed it over his mouth and nose. The impression was much stronger on the nose and air passages, and the first inspiration made him cough. He then counted to the third inspiration, and was gone. Pupils the same as before, unaffected; pulse before taking, 78; at the end of the first minute, 124; one and a half minutes, 100; and of two minutes, 78; no irregularity or intermittence. Anæsthesia in one minute. At the end of three minutes from the time of beginning he got up and walked across the room, and could have remained up. As an effort at prolonged anæsthesia this was not, therefore, a success. In eighteen minutes he was on his way driving to see a patient. He had not the slightest nausea after these two inhalations; felt, if anything, better than before.

Fifth Experiment.—His next trial of the agent and first attempt at administration was not satisfactory. The patient was a man aged about 50, a wiry, muscular fellow, of the type and build likely to give troublesome manifestations with any anæsthetic. He was placed on the table for an operation for hæmorrhoids, by Dr. Conklin, who had brought with him for the operation a large conical sponge, with which he was in the habit of giving the A. C. E. mixture. Upon this he poured two drachms of hydrobromic ether and placed it over the patient's mouth and nose. After one long, deep inspiration, his face became deeply flushed, and he soon began to talk and then to shout. More of the liquid was poured on the sponge; but his movements interfered with the inhalation of it with promptness; muscular rigidity then came on, and was marked; respiration was very nearly, if not quite, stopped for a time by tetanic spasm of the chest. These symptoms were almost as bad as are ever seen from ether, chloroform. or the mixed

vapors. The Dr. had seen worse muscular action and rigidity, but this was as bad as generally met with. During this time the ether was rapidly added until the supply was exhausted (13 drachms,) and sufficient relaxation was not produced to make the operation feasible. No observations could be made, of course, of the patient's pulse. He recovered consciousness quite rapidly, as compared with other anæsthetics, and suffered no unpleasant after-effects.

This was not, of course, a fair trial of the remedy. The mode of administration was decidedly faulty. It is an ether, and must be given as an ether; and that this is imperative is the lesson to be learned by this failure.

My personal experience with hydrobromic ether fully sustains the observations of others as to its exceeding promptness of action, and the rapidity with which recovery from its effects takes place. It is also more pleasant to inhale than chloroform, which is not very unpleasant, and infinitely pleasanter than ether.

In my own experiments on animals I found that frogs placed in a watery solution of ethylic bromide, become as completely anæsthetized as if they were immersed in an aqueous solution of chloroform.* Berger states to the *Societe de Chirurgie (Le Progres Medical)*, that he had been impressed by the rapidity with which these animals succumbed to its vapor. Terrillon administered the vapor of ethylic bromide to eighteen dogs without accident to any one of them.

Dr. Ott, of Easton, Pa., who has made thorough and scientific researches with the bromide of ethyl, experimenting upon frogs and rabbits, believes that the increased frequency of the pulse is due to stimulants of the accelerative nerves; or of the cardio-motor ganglia, and the dangers in administering the drug are less than those of nitrous oxide.

W. H. Hingston, Montreal, Canada, has used no other

*Op. cit. "Artificial Anæsthesia." Turnbull.

anæsthetic since commencing the use of bromide of ethyl. There is less resistance and struggling on the part of the patient. Vomiting is less frequent. It is eliminated from body more rapidly than any anæsthetic except laughing gas.

"Bromide of ethyl is one of the, and in some respects the, most valuable anæsthetic hitherto used."

In Terrillon's experiments, muscular relaxation occurred in human beings in two or three minutes; at times there was congestion of face, neck and upper part of the chest. The pupils did not contract, but were dilated. The pulse was always quickened, and every fresh dose caused fresh acceleration. Respiration was always hastened, and a hyper-secretion from the buccal and pharyngeal glands took place. Sensibility and consciousness returned with great rapidity; vomiting was not uncommon both during insensibility and sometimes for hours after. Verneuil, at the same meeting of the Societe de Chirurgie, stated that one patient, a woman, to whom he had given the vapor of ethylic bromide, was asleep in an instant; and Terrillon stated that anæsthesia may be produced in less than a minute. In our own experiments the shortest time necessary for primary anæsthesia was thirty seconds.

Dr. H. C. Wood found, by experiments upon animals, that if the vapor of ethylic bromide be given with moderation, anaesthesia may be produced without notable reduction of blood-pressure. He further observes (*The Th. Gazette*, June 15, 1885): "After mixing with olive oil and agitating and distilling the liquid with this precaution we can obtain a safe and powerful anaesthetic, well adapted to cases of minor surgery which do not warrant the exhibition of ether and chloroform, and particularly eligible in obstetrical practice. In the experiments of Dr. C. C. F. Gay,* of Buffalo, the agent employed was evidently, from color and taste, impure, as was also that used by Dr. D. C. Wilkinson,† of Galveston, Texas. In Dr. I. C. Moore's

* *Medical Record*, July 17, 1880.

† *Medical Record*, May 15, 1880.

cases the ethyl was abandoned for ordinary ether, even when the insensibility had not passed off, owing to the exhibition of so-called bad symptoms, great excitement, with intense and persistent retching and vomiting, with venous engorgements. The article was stated to be pure, and was from Wyeth & Brother. The bromide of ethyl is costly, from the great care required in its preparation; and the great demand for it has caused many imitations to be placed on the market. The importance of its purity was at first so little understood that the original manufacturers did not take sufficient time to purify it, so that for a time the article contained carbon bromide ($C_2 B_4$) and free bromine, phosphorus and bromoform.† These were found in the specimen employed by Dr. Sims, which was a brown acrid liquid, with a pungent and disagreeable odor. Twenty drops of this given to a rabbit which had previously taken two grammes (thirty grains) of pure ethylic bromide without the slightest ill effect, produced irritation of the gastrointestinal tract, followed by death in eighteen hours.*

That ethylic bromide may be employed with ease and success, has been abundantly proved by the experience of many observers. M. Bourneville has administered it to a large number of patients in the Salpetriere Hospital, for the arrest of paroxysmal hysteria and of epilepsy. He has also administered it daily by inhalation for fifteen or twenty minutes, with the fortunate result of considerably diminishing the frequency of the convulsive paroxysms. In several of these cases the temperature was depressed about half a degree centigrade during the act of inhalation. Immediately after the withdrawal of the anæsthetic the normal degree was recovered, and sometimes even surpassed. The pulse in about five hundred administrations was some-

† This can be prevented by mixing bromide of ethyl with five per cent. of olive oil, agitating and distilling the liquid successively.

* Dr. S. Wolff, *Am. Journal of Pharmacy*, May, 1880. The writer also obtained a portion of the same liquid from Dr. Wolff, and on comparing it with the specimen from Dr. Sims found it to be the same.

what accelerated during the period of inhalation. In six instances only was retardation observed. Respiration in like manner was almost always accelerated. A copious overflow of tears was nearly always remarked. The urine never contained either albumen or sugar, and the quantity of the liquid was not affected. Rigidity of the limbs and tremor involving the upper extremities, were sometimes noted. Daily inhalations for a period of two months exercised no unfavorable influence over the general process of nutrition; five patients found their weight increased during this period.

There are certain preparatory precautions which are necessary to the safe inhalation of the bromide of ethyl:

1. All tight-fitting garments in and about the neck and chest should be loosened.

2. The saturated ethyl vapor must be inhaled almost to the exclusion of atmospheric air. The best form of inhaler is a thick towel folded in the form of a cone, closed at the apex with a large pin; between the folds of the towel place a sheet of newspaper. The base of the cone must be wide enough to include both mouth and nose.

3. Instruct the patient, in advance, to make deep and long inspirations. In the cone place about one drachm, by measure, and at once cover the nose and mouth with it, and do not remove the cone until anæsthesia is produced, which will be in from twenty to thirty seconds.

The anaesthetic sleep will not last more than from two to three minutes. The patient retains the usual healthy color of lips and skin, and the pulse first becomes rapid, then slower and stronger as the narcosis becomes profound. The patient, as a rule, awakens suddenly and completely; but if there is nausea or much agitation, it is best for him to remain quiet and in a horizontal posture for some time.

Perhaps no operations are more painful than those on the eyes, eyelids, or eyeball, to a sensitive person, and there is no anaesthetic that I have found so applicable as

bromide of ethyl in such operations. I recently administered it for the removal of a deep-seated tumor of the eyelid; the operation being performed by Dr. Hermann Knapp, of New York. The patient took the towel, with about two drachms of the ether, in her hands and applied it to her face, and in thirty seconds she was so completely anaesthetized that she was not conscious of one particle of pain until the tumor was entirely removed; she had no nausea whatever, or any other disagreeable symptom.

Again, in operations on diseased mastoid cells, I have employed it in some twenty cases with entire success, and in a very recent case, in which the whole bone was diseased and much of it had to be removed, the operation was of a most painful nature. I administered the bromide of ethyl to this patient, who was very much exhausted by profuse discharge from a large cancerous growth. The patient went under the influence of this anaesthetic with the most delightful effect, not suffering at all from the operation, and going to sleep after it without a bad symptom.

We have, in times past, heard a great deal of the injurious effects of bromides; and for a time, therefore, we gave the hydrobromic acid and ether with great caution, never exceeding thirty drops three times a day. But not so now; experience has taught us that we can use it, if well diluted, up to sixty drops three times a day without any injurious results. To obtain its full physiological effects in epilepsy, certain cases of pulsating tinnitus aurium, and in preventing the disagreeable cephalic symptoms occasioned by quinine and iron in these various nervous affections, we have found it at times very satisfactory. The salts of this agent, bromine, can be, and are, used with the greatest freedom in the form of bromide of potassium, sodium, and lithium, in doses of grs. xl—3 vi, given in six days without the least fear of its injurious effects upon the most delicate stomach; and relieving, as by a charm, convulsions, epilepsy, whooping cough, sleeplessness, headache, cerebral disturbance, tetanus, and all forms of mental derangement.

As is well observed by Dr. Chisholm: * "For office use I find the bromide of ethyl invaluable on account of its promptness, efficiency, the evanescent nature of the anæsthesia, the absence of nausea, and the perfect comfort with which patients operated upon can leave my office within a few minutes after the etherization."

Bromide of ethyl should never take the place of chloroform or sulphuric ether where any tedious operations are to be performed; but there is no reason why this useful anaesthetic should not be employed in all operations in minor surgery and in those on the eye, ear, throat and nose: having everything ready in advance, so that the patient shall be as short a time as possible exposed to the evil effect of an anaesthetic.

I conclude this brief paper by a statement of the conclusions arrived at in 1879. My favorable opinion remains unchanged at the present time, after using the article from 1878 to 1886 in all my office operations.

	Minutes.	Seconds.
Shortest time taken to place a patient under the primary anæsthetic influence, . . .	0	30
Longest time,	5	00
Average time,	1	30

I did not then advise that bromide of ethyl should be resorted to in protracted operations, and I never have employed it in any case longer than forty minutes, and have never used more than four ounces of the pure ether in one case.—*Dental Advertiser*.

1502 Walnut Street, Philadelphia, March 13, 1886.

* *Maryland Medical Journal*, January, 1883.

ARTICLE II.

CARIES AND NECROSIS OF ALVEOLI OF
RIGHT SUPERIOR MAXILLA AND CHRONIC
INFLAMMATION OF ANTRUM, DUE TO
EXCESSIVE SALIVARY CONCRE-
TIONS AND A NEGLECTED
PULPLESS MOLAR.

BY B. MERRILL HOPKINSON, D. D. S., M. D., OF BALTIMORE.

I have had in the course of my practice during the past few years, what would seem to be, to judge from the experience of others, a large number of cases of diseases of the maxillary sinus. With few exceptions, the disease has been devoid of active symptoms, at the time I found it, the inflammation being of a chronic nature and showing itself either in the nasal cavity, or in the throat, rather than in the oral cavity and in connection with the dental organs. I have generally discovered these troubles in operations upon the teeth, either in extractions of teeth or roots, or in the treatment of these organs when in a pulpless state. The finding of incrustations of salivary calculus upon the teeth is of daily, almost hourly occurrence, and it is most surprising how great the accumulation may be, without ordinarily producing serious injury. The appended case, of which I give a record below, is one of those rare instances where caries and necrosis of the alveoli, together with antrum disease and its attendant evils, may be caused by great accumulations of calculus, complicated with a neglected pulpless tooth. I have never seen a similar case recorded, and I think it most interest-

ing for several reasons. I wish it were possible for medical men in general practice to be a little better acquainted with the diseases treated by oral specialists. It would indeed be a good thing for suffering mankind, and I am sure that thousands of patients would yearly save their valuable organs of mastication, and also be saved a great amount of unnecessary pain if such were the case. I have my attention called to this defect of education, as well as of study, time and again; and in the case below the young man had been variously treated, without lasting benefit of course, for general debility, malaria, &c., *ad infin*, before I was so fortunate as to discover the true cause of his trouble when he applied to me for oral services. The usual symptoms of antrum disease were absent; there did not seem to be any special indication, from an oral inspection, that would lead one to anticipate the finding of a bone lesion; indeed it was an obscure case, and yet the simple removal of salivary incrustations, as well as a tooth broken down with caries and containing a dead pulp, made the diagnosis clear, and placed the man in a condition to recover his health and strength. I would most respectfully suggest that general practitioners pay more attention to the condition of the mouths of their patients, and advise a more frequent calling upon the dental surgeon; for I am fully convinced from experience and observation that nine-tenths of those suffering from general maladies would be greatly benefitted by such visits, and the services of each would aid the other.

Mr. S., office clerk, bilious-nervous temperament, age 21, consulted me June 18, 1885, concerning his oral cavity, which was sadly in need of treatment. Notwithstanding the fact that he is a young man of good education and surroundings, he had neglected his mouth in a shameful manner, the result being vitiated secretions, most imperfect mastication and consequent indigestion, and a general condition of ill-health. He complained of pain of a general character, and it was difficult to localize any particular

lesion, on account of the wretched condition of a number of teeth, and the fact of there being no special soreness or tumefaction present; but, from symptoms as described, and having found pus mixed with the nasal secretions, and detected a bad odor not due to carious teeth, I diagnosed, together with dental troubles, disease of a deeper seated nature than that of simple caries of these organs, and began to look elsewhere for the principal seat of his difficulty. After careful examination into his history I eliminated specific disease. He was very anaemic, complained of weakness, anorexia, and inability to apply himself steadily at his avocation; was habitually constipated; thought, as most of the sick laity do in these days, that he was suffering from aggravated Bright's, and was generally miserable and depressed. A prominent symptom was profuse and obstinate epistaxis principally from the right side, that nostril being almost continually occluded, save at these periods. I immediately proceeded, as the first step in local treatment, as well as an aid to diagnosis, to condemn and advise the extraction of seven teeth, and having the concurrence of my patient commenced operating. I removed five teeth with the patient in a conscious state, and without the aid even of a local obtundent, but as soon as I arrived in turn at the superior right second molar, he suddenly refused most positively to have me go on, saying that he had an indefinable fear of having that and the adjoining tooth removed, unless he was first rendered unconscious. There were no external evidences of disease, save enormous incrustations of salivary calculus, and unhealthy appearance of the gums, due to that cause; but, persuasion being useless, I allowed him to inhale a suitable quantity of nitrogen monoxide, and, first having removed a sufficient amount of the calculus, applied the forceps to the second molar and with surprising ease removed it, brought with it an inch of the alveolar border, loosened the third molar, and left the gums hanging like two curtains uninjured. I immediately removed the third

molar, which brought with it a portion of diseased alveolus, leaving the gums as before, there appearing to be no connection between them and the bony parts which came away.

Immediately following extraction came a profuse flow of blood mixed freely with offensive pus, giving unmistakable evidences of necrosis. His reaction, as is the rule when N₂O is administered, was rapid, complete and satisfactory. I explained to him the condition of affairs and commenced a careful examination with a view of discovering the extent of the disease. I found I had removed the alveolar border entire, down to the body of the bone to the extent of about one and one-half inches. I proceeded to remove all further discoverable portions of carious bone, carefully washed the parts with a carbolized solution, and in continuing my examination found that a probe could be easily passed through quite a large opening into the antrum and injections through the opening found their way most readily into the nasal cavity. I found here then the seat and principal cause of all his trouble. This state of things had evidently existed for some time and he was quite unaware of any disease of the parts, anything more than a general uneasiness which he attributed to a carious tooth. The removal of the calculus and tooth removed, of course, the cause of the disease, made a diagnosis sure, and laid the foundation for permanent general improvement. Everything seemed favorable for successful local treatment, the tendency to haemorrhage seemed *nil*, there being very little bleeding since the first gush after removal of the teeth, and after thorough injections with a tepid carbolized solution, two per cent., a suitable dressing of absorbent cotton, saturated with the solution to keep the wound patulous, permit drainage and prevent sepsis, which dressing the pendent gums enabled me to apply satisfactorily, I dismissed him for the day, and enjoined him to remain as quiet as possible and to return next day. Before leaving I prescribed a pill to be taken daily, or on each

alternate day as required, at bed time, containing res. podophyl gr. 1-5, aloes aq. ext. gr. $\frac{1}{3}$, to regulate his bowels, told him to bring me a sample of urine for examination, which I afterwards found to be normal, and this fact enabled me to aid him in dismissing from his mind the awful bugbear of morbus Brightii. On the following day, I found that he had disobeyed my injunction to keep quiet, and had managed to get my dressing displaced, and in so doing had caused a slight hæmorrhage which alarmed him, and he applied immediately for professional services in the locality in which he happened to be. My worthy friend and brother succeeded in stopping the hæmorrhage, and also, in doing just that which I desired most to avoid, viz: using a solution of an iron salt, and plugging up the cavity so tight that proper drainage was completely arrested, and my young man presented himself in a sorry plight with a very swollen face. I removed the great mass of cotton causing hæmorrhage again, but it was easily overcome by tepid injections, thoroughly injected the antrum and other diseased parts with solution as before, renewed the dressing of the previous day, and also my injunction as to quiet. I am of the opinion that the use of Monsell's solution as a styptic is seldom required in oral, or indeed in general practice, and it should be avoided when possible, the formation of an insoluble clot followed by sloughing naturally causing a retardation of the healing process. The same local treatment was continued for nine days with very satisfactory results and the progress towards recovery was remarkably rapid. The pills operated very kindly and after four days it was only necessary to repeat them on each alternate day. I prescribed for him tr. ferri. muriat. gtt. x et quiniæ sulph. grs. ij to be taken thrice daily; at the end of the nine days I omitted the dressing, previous symptoms had disappeared, and he was in condition to have seventeen fillings inserted in his remaining teeth, which operations I commenced shortly after. On October 29, or a little over four months from first operations, I

inserted for him a partial superior denture, filling all vacancies, which he is wearing with much comfort, and is now in full possession and enjoyment of good health. The diseased tooth I found upon examination to contain a mummified dead pulp, the roots were greatly exostosed, in fact, were three times their normal size, judging from the size of roots of his other teeth, were firmly adherent to their alveoli, and the palatine root had evidently penetrated the antrum. There were no signs of alveolar abscess. This case demonstrates clearly two things; first, that excessive salivary concretions may do a great deal of harm, though such cases are most rare, and that when calculus is present upon the teeth it should invariably be removed. Secondly, that it is dangerous to leave a pulpless tooth in the dental arch *unattended to*. I will say in conclusion that the latter class of teeth, of which the dentist finds a great many, may *by proper treatment* be made wholly innocuous, and put in a condition to perform their proper functions with perfect comfort and satisfaction for an unlimited number of years. I speak decisively and authoritatively on the subject of pulpless teeth, from the fact that I have read during the past year extracts from papers of a prominent physician in which he condemns what *he* calls "*dead teeth*" in a wholesale and finished manner. Such condemnation is not due to ignorance, but to lack of a critical examination of the subject. Pulpless teeth are not *dead*, they have only lost their inner life, that of the pulp, and still receive adequate nourishment through the periosteum to preserve their vitality, in part, indefinitely. If they were *dead*, the condemnation of my learned brother would be just, and if not removed by the specialist, nature herself would not tolerate them but would cast them off as bodies, foreign to the animal economy.—*Md. Med. Journal*.

ARTICLE III.

THE WISDOM TEETH.

BY J. D. THOMAS, D. D. S.

[Read before the Odontological Society of Pennsylvania, January 2d, 1886.]

The troubles arising from the growth and retarded eruption of the wisdom tooth, which appears to be governed by laws entirely its own, are so many and so severe in their character; that it seems strange so little has been done by the profession at large in mitigation of the evil, other than the heroic treatment,—extraction. From malposition and crowding, it is the source of untold distress, over which the patient has no control, and is more perplexing to the dentist than any other tooth presented for his skill. It shows itself sometimes with its crown pointing directly towards the tongue, with roots lying almost diagonally across the jaw, and sometimes so far embedded in the cheek that its lingual surface will be on a line with the buccal surface of the anterior molars; at another time it will be in what may be considered its normal position, but if an inferior one, situated so far back in the angle of the jaw that perfect eruption is impossible. The most common and trying position for both patient and operator, however, is when it comes obliquely from the angle of the jaw, with its crown pressing firmly against the posterior surface of the second molar. These are the cases which cause so much suffering, not only from the growth of the tooth itself, but frequently from injury to the second molar, while its extraction generally entails still further suffering for days, and perhaps weeks, after the operation, with a possibility of ultimate loss of the second molar too.

There are three forms of suffering produced by the wisdom tooth, the cause for two of which may be defined by one word, "pressure." In many instances from defective structure, the tooth will become decayed to the pulp almost as soon as it makes its appearance in the mouth; and this form of difficulty will present itself as an ordinary case of tooth-ache, with perhaps neuralgic accompaniments, which, according to indications, may be treated by remedial application, or extraction advised. The latter course will be referred to later on.

Of the two forms, the cause of which is attributed to pressure, the principal one is abscess in the angle of the jaw, sometimes of slight degree, but more frequently of such serious nature as to involve considerable swelling of the cheek and maxillary glands, and perhaps extending into the soft tissues of the throat, so as to cause entire cessation of mastication, greatly impeding the swallowing of even liquid articles of nutriment. The results attending these conditions are sometimes most serious. Besides the necessary confinement of the patient, should the abscess break on the outside of the cheek, there is the scar which he has always to carry. The prostration produced by suffering and inability to take proper nourishment will take a long time to recover from completely; and I have seen cases in which not only the preceding molar or molars have been sacrificed, but a considerable portion of the bone has become necrosed also, and in a few instances the effect upon the masseter muscle has been such that perfect motion to the lower jaw has never been regained. Such are some of the varying phases of condition which this tooth causes to exist. If our patients would come for assistance at the first approach of the difficulty a good deal of their suffering might be averted, but as a rule they come as a last resort, after the application of all the home remedies they know of, and perhaps after the efforts of their family physician has failed to afford relief.

The third form, as caused by pressure, presents itself

in a condition of extreme suffering of apparent neuralgia. The patient will complain that he has been the victim of slight attacks for sometime, but not of sufficient severity to cause him much inconvenience; but now the pain has become unbearable, and he thinks he can locate its origin in the partially erupted wisdom tooth. These cases have been found most perplexing, for the reason that careful examination has failed to disclose the slightest defect about the tooth that could confirm the patient's idea that it was the source of his pain. There will not appear to be the least inflammation about the parts, and everything will seem perfectly healthy. The second molar will present a like good condition, and yet the patient is suffering the greatest agony. In one case of this character, upon examination, the inverted wisdom-tooth crown was found pressing directly against the posterior root of the second molar; the only portion visible of the wisdom-tooth, was what in its proper position would have been its posterior surface, and only enough to show how the tooth lay. There was no decay exhibited in either it or the second molar, neither was there the slightest tenderness to tap, or the application of warm or cold. The pain seemed to originate in the wisdom tooth, as near as the patient could describe, though it included the ear and the whole side of the face, yet nothing could be made to appear that would confirm it. Being averse to counsel extraction without a clear understanding that good would result from the operation, the patient was about being advised to look elsewhere for the cause, or at least defer it until later, to see if something might not show itself, to indicate more clearly that he was right, when, upon final examination, it was found that pressure against the second molar, toward the wisdom-tooth, would start the pain. This was convincing. After extracting the second molar there was found, three-sixteenths of an inch from the apex of the root, an opening into the pulp canal, caused by the anterior cusp of the wisdom-tooth, in its lateral position, pressing against the

dentine, until by absorption it had penetrated into and was pressing against the pulp, which was much inflamed. Since meeting this condition, I have seen several of like character, sufficient to show that this form of disease is by no means uncommon among the ills to be charged to this unruly organ.

I do not wish to be considered as asserting that these teeth, in their malposition, are always the cause of trouble to the patient. On the contrary, many of them will become fully developed in the jaw and never perfectly erupted, yet will not have caused the slightest inconvenience, though in a paper read before the New York Odontological Society, by Dr. La Roche, and published in the July number of the *Dental Advertiser* a case is described of a gentleman whose mental condition bordered upon insanity, diagnosed to be caused by the retarded eruption of these teeth, and the result of a cure following their extraction, proved the diagnosis correct. From his description, Dr. La Roche seemed to form his opinion entirely from the one fact that the teeth were present in an unerupted state. I have seen a number of cases where patients have suffered in like manner, if not so severe, and the cause has been attributed by themselves and their family physicians to these partly developed teeth; but upon examination there could be nothing found to satisfy me positively that they were the cause of the trouble, and relief was not obtained by their extraction. From this experience, I hold to the opinion that because a wisdom-tooth may be, as we call it, inverted, it is not always the cause of the suffering from both the aural and facial neuralgia attributed to it, any more than an unerupted tooth anywhere else in the mouth. We all know that it is not an uncommon occurrence to see among our patients a mouth in which a bicuspid, a lateral, or even an eye tooth is wanting, even in persons advanced in years, and upon extracting an adjoining tooth the missing one is found fully grown, but so crowded in the jaws that eruption has been impossible, though in its healthy state we would

not look for the source of neuralgia in such a tooth. In one case of this kind that came to my care for extraction, the patient was a great sufferer from neuralgia, which was attributed by her physician to her teeth, all of which in the upper jaw were more or less badly decayed. In extracting it was noticed that the canines were absent, but the patient could not recall ever having had them extracted. Upon examination after the operation, the crowns of the eye teeth were distinctly felt, imbedded in the jaw in an almost lateral position. The patient was nearly sixty years of age. Owing to the depth of the position of the teeth, extraction was not advised at that time, but relief was obtained for the space of two months, at which time the neuralgia recurred more severely than ever, and it was decided to extract the eye teeth. There was nothing in the appearance of the gum to lead to the supposition that they were the cause other than the knowledge of their presence in the jaw; but there was hope that their extraction might exercise some influence to give her relief. The cessation from pain lasted only about three weeks after the operation, showing that the teeth were not the cause of the neuralgia.

To return to the consideration of the wisdom teeth. The prescribed treatment in most cases is extraction, and there is no doubt that many people would be better off without them; but extraction, besides being difficult for the operator, becomes a matter in so many instances of such serious consequence to the patient that there ought to be such consideration given to the subject that would result in sparing him much that he now has to bear. I do not mean that extraction, in all cases, is productive of so much annoyance. There is, as a rule, little to apprehend with the superiors, and many of the inferiors are accompanied with no more after pain than any other tooth, but I refer particularly to the irregular ones of the lower jaw.

In the first place they grow out of the solid bone, right at the angle, where there is no alveolar process. The bone broadens here and is very dense, so we have solid

bone on both the buccal and lingual sides, the ramus over the roots and the second molar in front. In the second place, they invariably grow with curved and distorted roots, so, to extract them any how you will, it can be done only by great effort and with subsequent suffering on the part of the patient. If it should be a badly decayed one, the chances are that there will not be strength enough in the tooth to bear the force necessary to loosen it, in which case it becomes necessary to cut it down as deeply as possible, extract the pulp and leave the remaining portion to work up to the surface for future operation; or get over the bone and cut through it, with the alternative of extracting the second molar to give a better opportunity to extract the wisdom-tooth. In either case the patient will have a very sore mouth, which will require treating for perhaps several days. If the case be one causing trouble from pressure alone, extraction is likely to be attended with better success, but the immense strain upon the parts already inflamed by the process of eruption, will cause a still greater amount of inflammation, with perhaps a severe abscess as a result. It is always necessary to have the patient pay repeated visits, or else to visit them at their homes for after treatment. In a few cases where they have neglected to pay attention to instructions and have applied home remedies in the shape of poultices to the outside of the face, or have called in their family physician, I have been invited to pay for his services, and even threatened with suit for damages for loss of time and suffering. Being a witness to so much that is unsatisfactory, I have been led to advise in many cases the removal of the second molar in preference to disturbing the wisdom-tooth. If the latter is growing straight, it will move forward and prove a very useful organ, and should it be one with the crown pressing against the second molar, I prefer the anterior tooth, for the reason that from the position of the wisdom-tooth its removal will cause much friction against the posterior root of the second molar. I have seen several in which the pulp

has died, accompanied by ultimate loss of the tooth as a result. To relieve the pressure is the object sought, and in a case where the pain of extracting the wisdom-tooth is likely to be severe, the removal of the second molar has been found to give the greater satisfaction.

After extraction is decided upon, how it shall be done is a question for each operator to elect for himself. I lay no claim to superiority, for my own methods over those of others, preferring the general success attending the operation should speak for itself. I read an article in the February *Dental Cosmos* in which the writer claims at this day, that the key will extract certain teeth "more readily, easily, quickly and successfully than any other instrument ever invented." I am willing to admit that it makes very little difference with what instrument it is done, if only the operator has become accustomed to its use, and it suits his purposes best. A former professor in one of our dental colleges has said that to be a proficient dentist, one should be able to fill a tooth with a rusty nail; upon the same teaching a man ought to be able to extract teeth with a pair of gas plumber's pliers; but I cannot see the policy of becoming so accustomed to their use that they will be claimed as the best instrument extant for that purpose. Some operators recommend the use of the Physic forceps for the extraction of these teeth, but I fail to see in them any advantage over the regular forceps, but probably, like the key, it may be from ignorance of their proper use. It is necessary that instruments should be so constructed in their beaks as to insure a firm hold upon the tooth without slipping; there should be as little curving in the handles as possible, so as to bring the force in extracting as near a direct line from the hand to the tooth as possible, and the operator should assume a position with the patient that will insure the greatest amount of force with the least physical effort. To the wisdom-tooth the exertion must be applied to loosen it in its socket before any attempt at pulling should be made, after which its removal depends upon

whichever way the position offers the best advantage. In cases where it is locked in by the second molar after loosening, it can be turned and worked in its socket until the bone on either side is sufficiently distended to allow the tooth to be taken from under the second molar; but it is just this distention of the bone that comes after trouble. Sometimes, instead of giving, a considerable portion of the bone will break away on the sides to which the force expended. This will cause no permanent injury, provided the broken portion is removed and the wound left to heal without irritation; but it adds to the serious consequences of extraction as a remedy for these conditions.

I would suggest judicious extraction for children from ten to fourteen years of age, as a prevention of the evils produced by the retarded eruption of these teeth. Though not an advocate of the removal of all sixth year molars, I am confident there are thousands whose mouths would be benefitted by the practice.

Never until a month ago have I seen a case of difficult eruption of the wisdom-tooth, where there had been a tooth extracted on its side. In that case all four of the second cuspids had been extracted for regulating, and yet the right lower wisdom had not room to grow in place; but that is the only one I have ever noticed, and there is no doubt, if upon careful examination of the mouths of young persons, the removal of a tooth was advised, all around, either the first or second molar, or one of the bicuspid, as good judgment would dictate, that the operation would be productive of great good to the patient; and would entirely obviate the difficulty attending the crowding of the wisdom-teeth, taking, of course, due consideration of the development of the jaw, the size of the teeth generally, and the prospect of future growth.

DISCUSSION.

Dr. Chupein.—I have seen so much benefit result from the extraction of the sixth year molars, and I think in the majority of cases it is the best thing to do, since it gives

ample room for the eruption of the wisdom teeth. These decay frequently, not because they are weaker than the other teeth, but because their crowded condition causes the gums to fold over them and form pockets for the retention of food.

Dr. D. Neall.—By means of the Physic forceps I have repeatedly pushed out the wisdom-teeth; years ago I frequently used the key in the extraction of the sixth year molars without soiling the instrument with the blood or other fluids of the mouth.

Dr. Wood.—A gentleman was in my chair this morning with a complete set of good sound teeth. One-third of the lower wisdom-teeth were ground away by the upper ones, apparently the result of an effort upon the part of these lower teeth to assert themselves, and get out of their unnaturally cramped position. I have for years advocated the extraction of sixth year molars, too weak to be anything but an embarrassment in saving of better teeth. I recall one case where I condemned and extracted the lower sixth year molars of a boy about twelve years of age. When I saw him again he was about twenty years of age. I found the second molars largely occupying the position of the absent first molars, and the wisdom teeth fully erupted, and well developed; but there was no indications of the coming of the superior wisdom-teeth.

Dr. Tees.—Troublesome cases of horizontal eruption of the wisdom-teeth are seldom met with in general practice. The specialist meets with them more frequently, on account of the large number of patients demanding extraction. The more general extraction of the sixth year molars at eleven years of age, when presented with approximal decay, would tend to obviate the painful eruption of the wisdom-teeth.

Dr. Darby.—I most heartily endorse all that Dr. Neall has said in favor of the Physic forceps. I have always looked upon them as a most valuable instrument for the extraction of wisdom-teeth. Were it used oftener in a

skillful way, less injury would be done to the jaws than by endeavoring to remove such teeth without them.

I would enter my protest against the common practice with some of removing the sixth year molars. I frequently see the bad effects of the too general extraction of these teeth. I am well aware that in some mouths their removal is attended with good results; but to extract them indiscriminately, because they are sixth year molars, and more or less prone to decay, is in my opinion bad practice. I know of one dentist in this city who seems to have doomed all sixth year molars that come under his treatment; and I am frequently seeing the bad results of his practice, often large spaces between the anterior teeth, and in some instances the bicuspid's close neighbors of the second molars. We should study a mouth well before deciding to remove from it, the largest and in some respect the most important teeth of the set.—*Dental Office and Laboratory.*

ARTICLE IV.

EFFECTS OF AMALGAM FILLINGS UPON THE SYSTEM.

BY E. A. BOGUE, M. D., NEW YORK.

(Read before the Dental Society of the State of New York.)

The subject given me to speak upon I consider a most unfortunate one—"The Effects of Amalgam Fillings upon the System." There are none, so far as proven. But as at least a few words are expected from me, I take the liberty of bringing before you the results of a few experiments that have been made, and a little of the guess-work that has been published since 1882. I was unable to find any record of experiments made previous to that time upon the

subject, although I have looked back for forty years. Since then, Dr. Hitchcock, Dr. Talbot and Dr. S. P. Cutler, formerly of New Orleans, have all made experiments, most of which have been carefully conducted. The conditions which existed in the mouth have been detailed, and I will briefly rehearse a few of the principal experiments and the conclusions drawn from them.

Dr. Talbot's paper is published in the November number of the *Ohio State Journal*. I may, perhaps, be pardoned for rather sharp criticisms, for the time is short, and I am fully aware that sharp criticisms will be applied to what I say.

Dr. Talbot says in his experience: "A sufficient portion of the material is rubbed in the hand and placed in the tooth." His article is exceedingly loose in that particular. Good amalgam fillings are not made in that way, but the constituent parts are carefully weighed and the proper proportions preserved. Eight experiments were made by Dr. Talbot, by heating amalgam fillings in bottles to about 100 degrees, and a vapor was given off, blackening test paper; yet this same article notices other large amalgam fillings which were kept three months at 100 degrees that showed no change, and in others he notes an increase in weight from oxydation that has taken place.

Dr. Talbot fails to realize the difference between amalgam placed and kept continually in a hot and dry position and amalgams kept most of the time wet by the saliva.

Amalgams well made will not part with their mercury under about 400 degrees.

He speaks of cases of poisoning caused by amalgam fillings, and giving the verdict of a coroner's jury would have you believe that death was caused by the "existence of the amalgam in a second molar tooth on the right side of the lower jaw." The loose talk of an average coroner's jury is given as a scientific fact.

My own experiments in 1883 explain some other facts. A large variety of amalgam fillings were kept by me at 100

degrees for three months, but were kept in saliva, and they seemed to gain in weight. They were all weighed down to one-tenthousandth of a gramme. But in all the varieties tested by me there was no mercury found in the bottle, either by myself or Prof. Chandler, who tested the specimens after me to prevent the possibility of error.

Dr. Pease, of Dayton, has made some experiments, it seems, and as he is an old practitioner and a man of decided good sense, judging from his writings, I have the pleasure of noting what he says in the *Ohio State Journal* for September, 1882.

Dr. Pease says he has never seen any bad effects in any of his patients from amalgam fillings used in connection with gold, and he then calls attention to the blue mass pill so often administered, which take three days to work off. He asks what becomes of the mercury lying in the system during those three days; has it or has it not been absorbed? He assumes that there are cases of administration of mercury from drugs where poisoning would occur more than from fillings in the teeth.

If amalgams are inserted with a large surplus of mercury, the metallic mercury may be found in the mouth after the pressure that is applied to the filling brings the mercury to the surface, and from there is carried to the stomach as metallic mercury. I have read within the past two months of something like two pounds being put into the stomach of a patient by means of a tube to correct an impaction of foul matter, and in a few days the mercury was discharged and the patient then recovered.

We might argue, I think, that metallic mercury was harmless unless converted into an oxide or chloride.

I once more refer to Dr. Pease, who is exceedingly apt. He says if mercury exudes from a tooth through a defective filling, don't blame the mercury, but the dental colleges who license such men to do dental work.—*Odontographic Journal*.

ARTICLE V.

THE LAW REGULATING THE PRACTICE OF
DENTISTRY IN THE STATE OF
VIRGINIA.

Approved February 26th, 1886.

1. Be it enacted by the general assembly of Virginia, That from and after the passage of this act it shall be unlawful for any person, except regularly authorized physicians and surgeons, to engage in the practice of dentistry in the commonwealth of Virginia, or to receive license from any commissioner of the revenue, unless such person has graduated and received a diploma from the faculty of a reputable institution where this specialty is taught, and chartered under the authority of some one of the United States, or of a foreign government, acknowledged as such, or shall have obtained a certificate from a board of examiners duly appointed, and authorized by the provisions of this act to issue such certificates; provided, that nothing herein contained shall prevent any person from extracting teeth for any one suffering from toothache.

2. That the board of examiners shall consist of six practitioners of dentistry, who are of acknowledged ability in the profession. Said board shall be appointed by the governor, who shall select from twelve candidates named by the Virginia State Dental Association at their next annual meeting, of whom two shall serve one year, two for two years, and two for three years, and to reside in different sections of the state; and each year thereafter two shall be appointed in the same manner from four nominees, to serve for three years, or until their successors are elected. All vacancies for unexpired terms shall be filled by the governor from names furnished him by the board.

3. That it shall be the duty of this board:

First. To meet annually at the time and place of meeting of the Virginia State Dental Association, and at such other time and place as the said board shall agree upon, to conduct the examination of applicants. They shall also meet for the same purpose at the call of any four members of said board, at such time and place as may be designated. Thirty days' notice must be given of the meetings, by advertising in at least two of the daily papers published in the commonwealth of Virginia.

Second. To grant a certificate of ability to practice dentistry, which certificate shall be signed by said board, and stamped with a suitable seal, to all applicants who undergo a satisfactory examination, and who received at least four affirmative votes.

Third. To keep a book in which shall be registered the names and qualifications of each, as far as practicable, of all persons who have been granted certificates of ability, to practice dentistry under the provisions of this act.

4. That the book so kept shall be a book of record, and transcripts from it certified to by the officer who has it in keeping, with the seal of said board of examiners, shall be evidence in any court of this commonwealth.

5. That four members of this board shall constitute a quorum for the transaction of business; and should a quorum not be present on any day appointed for their meeting, those present may adjourn from time to time until a quorum is present.

6. That any person who shall, in violation of this act, practice dentistry in the commonwealth of Virginia, shall be liable to indictment in the circuit, county or corporation courts; and on conviction, shall be fined not less than fifty nor more than two hundred dollars: provided, that any person so convicted shall not be entitled to any fee for services rendered; and if a fee shall have been paid the patient, or his or her heirs, may recover the same as debts of like amount are now recovered by law.

7. That all fines collected shall inure to the public school fund of the county or corporation in which the prosecution occurs.

8. That nothing in this act shall apply to persons who shall be engaged in the practice of dentistry in this commonwealth at the time of or prior to the passage of this act.

9. To provide a fund to carry out the provisions of the third section of this act, it shall be the duty of said board of examiners to collect from those who shall appear before them for examination the sum of ten dollars each.

10. This act shall be in force from its passage.

ARTICLE VI.

GERMAN TRIAL FOR HOLDING AN IRREGULAR DIPLOMA.*

The so-called "American dentist" Henry Sander, used years since the title "D. D. S.,—Sander," who never was in America, showed the government a diploma of the "Nova Anglica Universities of Boston," which he obtained in absentia through an English agent. Sander was condemned to pay by the government fifty dollars. Generally this diploma of "Dr. in absentia" being given out at the name of Philadelphia, but the latter was and many others are at the name of other cities in the United States. The government found out that there don't exist in the United States of America, neither a American University of Philadelphia, nor a Electic Medical College of Pennsylvania, or a Livingstone University of America, or a Nova Anglica Universities of Boston, or a University of South-Ohio of Cincinnati, or a Wisconsin Dental College.

There are still people who buy this kind of diplomas, therefore we only can be very glad that our government acts so strongly against this "Dr. in absentia." The reputation

*Translated by Arnold Wietfeld.

of the better American Institutions can only be ruined by these swindlers, as the numerous and good schools in dentistry of Baltimore, Boston, etc. cannot be made responsible for this kind of business, especially because the better Universities and Colleges require two years study since last year.

Our jury acts very strongly against the so-called "American dentists in absentia."

A short time ago we would mention the sentence of the mechanical dentist Zahntechniker Reseock, who never was in America, but nevertheless called himself M. D., D. D. S.

Since then the dentists "Von Guerard and Grunbaum" had to defend themselves on account of their bought title of American D. D. S.

It was also announced to the Hofzahnarzt, Er Robert Telschow, who likewise never had been in America, and also called himself American D. D. S., that if he should call himself any longer D. D. S., he would be punished according to law.

It has been confirmed by the government that the Doctor manufactory, so-called American University of Philadelphia, has not only nothing to do with the University and the dental colleges of that town, but don't exist at all, but that a swindler, John Buchanan by name, made a good deal of money by selling diplomas of "D. D. S. in absentia;" in consequence of which he was punished to stay in jail several years.

The name of the city of Philadelphia is according to this, not very well liked, but without any reason, because the good institutions of this town cannot be made responsible for this swindle.

Berlin:—F. ZEITUNG.

CHICAGO COLLEGE OF DENTAL SURGERY.

The fourth annual commencement exercises of the Chicago College of Dental Surgery were held at the First

Methodist Church, Chicago, on Wednesday afternoon, March 31st, 1886.

The class valedictory was delivered by Robert E. Moon, D. D. S., and the address to the graduates by W. L. Copeland, M. D., C. M., M. R. C. S., professor of Anatomy.

The number of matriculates for the session was eighty-one, an increase of thirty-one over the previous course.

The degree of D. D. S. was conferred on the following graduates by Dr. James A. Swasey, President of the Board of Directors.

Harry Fenn Carson,	-	-	Illinois
Emory Melvil Cheadle, M. D.,	-	-	Oregon
Louis Clusmann,	-	-	Illinois
Joseph Grant Emery,	-	-	"
Gilbert Walter Eutsminger,	-	-	"
Frank Eshbaugh,	-	-	"
Ernst August Huxmann,	-	-	"
Henry Frederick Marcoux,	-	-	"
Joseph Perry Mertes,	-	-	Wisconsin
Theodore Felix Molt,	-	-	Illinois
Robert Ellsworth Moon,	-	-	Indiana
Otto Henry Staehle,	-	-	Illinois
James Stewart,	-	-	"
Thomas Benton Wheeler,	-	-	"
Ellsworth Otis Whipple,	-	-	New York
Alfred Rogers Wilcox,	-	-	Illinois

T. W. BROPHY, *Secretary.*

To State and Local Dental Societies :

Remember that every local society which has adopted substantially the code of ethics of the American Dental Association, is entitled to one delegate for every five members. Appoint your delegates soon and let all unite in making this the largest and most profitable meeting of the Association ever yet held.

J. N. CROUSE,

Chairman of Executive Committee.

CHICAGO, April 16, 1886.

To the Members of the American Dental Association :

The votes of nearly all the members have been received. A majority of the votes cast are in favor of Chicago over all other places. And a very large majority pledge their attendance if the meeting shall be held in Chicago. But in deference to the minority and for the sake of harmonizing all differences, as Chairman of the Executive Committee and Committee of Arrangements, I hereby, with the consent of my Colleagues, announce the next place of meeting to be at Niagara Falls, August 3.

Information concerning Hotel and Railroad rates will be given later.

J. N. CROUSE,

2101 Michigan Ave.

Chairman of Executive Committee.

Editorial, Etc.

THE MARYLAND DENTAL LAW AMENDMENTS.—At the session of the State Legislature just closed, some important amendments were made to the dental law of this State, which renders it more liberal in its action, and more protective against the mountebanks and charlatans, who, for years past have infested the streets of our city on gilded chariots and with brass-band music.

The amendments relate to diplomas of reputable dental schools in other states as well as Maryland, being recognized, and the striking out of the illiteral provision of the old bill which restricted the practice of dentistry to graduates of the Maryland Dental Schools, or an examination by the Board of Dental Examiners; also the amendments prohibiting charlatans from going about the streets extracting teeth as an inducement for the purchase of quack medicines.

When the original bill containing the objectionable features recently removed from it was presented to the State Legislature for action, a much better bill had been suggested by the Maryland State Dental Association, against which a crusade was made, on account of its requiring an evidence of proficiency from all who had not been engaged in the practice of dentistry for ten years previously. The result of such an uncalled for opposition was the enacting of an illiteral bill, prepared in great part, we believe, by the judiciary committee of the House of Delegates, and to which the amendments have recently been made. A few more amendments, and this State law of Maryland will conform to the bill suggested by the State Society, an event to be desired, as then Maryland will have a proper dental law which will perfectly protect both the community and the dental profession. Had the bill as proposed by the State Society become the law, all the trouble attending the passage of the amendments would have been avoided. The instigators of the opposition are beginning to find out that it would have been better to have advocated, instead of opposed the State Association bill, and thus prevented the great blunder which required time and labor to correct.

THE COMING MEETING OF THE AMERICAN DENTAL ASSOCIATION.--Although this Association voted to select San Francisco as its place of meeting for 1886, yet it has finally been determined to once more return to Niagara Falls. No doubt our California brethren will be greatly disappointed at this change, for we learn that preparations had already been made to welcome the members of the Association in the Golden Gate City. Judging from an experience in 1882, the dental profession in attendance would have been most hospitably entertained by the California dentists and the trip would have been a delightful one for all who have never visited the Pacific Coast. We think a great opportunity as well as pleasure has been lost by this change.

DR. B. H. TEAGUES' DEPRESSED ENGINE DISKS.—Dr. Teague, of Aiken, S. C., has devised a new disk with a de-

pressed centre, which answers the purpose of finishing fillings on approximal surfaces and near cervical portions of the tooth crowns in a very satisfactory manner. We are certain that all who use them will find that they are a great improvement over the flat disk.

Monthly Summary.

PREVENTION OF BAD TEETH.—An exchange says the troubles which arise from disease of the teeth, or from their loss, are not always directly referable to their cause. When actual toothache is present there is of course little doubt, and the remedy of extraction at once presents itself. At the same time, it must be remembered that the forceps does not undo the work of disease or make amends for its ravages. A jaw which has lost the best part of its function with its teeth, or which bites unequally with the scattered survivors of its former armament, is but a deceitful guardian of the passage of the stomach; while it seems to do duty in mastication, it passes intact much that is unfit for the immediate action of the gastric juice. Were the relationship between bad teeth and dyspepsia, with its consequent discomforts, better understood, we should probably hear less of the prevalence of dental caries. Greater attention would then be paid to the small organs whose obscure influence on the general health so fully justifies their preservation. Specific constitutional disease, drugs, and other special factors no doubt account for a certain amount of dental decay. Neglect, however, accounts for much more. Want of care in choosing food, and particularly in cleansing the teeth, has nearly everything to do with the dental worries of a great many people. A point well worthy of note in this connection is that most of the permanent set of teeth come into active operation during childhood or early youth. It is hardly to be expected that children, if let alone, will pay much attention to

the state of their mouths, unless driven to notice an aching stump. Thus it happens that most children have lost one or several teeth before they are well into their teens. Here, then, there is need for parental supervision. Mr. W. M. Fisher, of Dundee, has been led by certain observations, which proved the defective condition of the teeth in a majority of school children, to suggest that some regular system of supervision by a dentist be adopted as a part of school management. The expenses he would have defrayed by the parents, or, should they be too poor, by the State, out of the education grant. This plan has been actually adopted in the parochial school at Anerly, in Surrey. We have long been of opinion that it would be most desirable if the health of children in all schools could by some plan be periodically passed under review by a medical inspector. The possible obstacle to such an arrangement would be the expense. This may not prove insuperable, and if it does not, we may hope that this method, and also some plan of dental supervision, may find their place among the recognized forms of school discipline.—*Dental Register*.

PROSECUTION OF A DENTIST.—At the Manchester Assizes last month, before Mr. Justice Day, an action was brought against Mr. James Jackson, dentist, Burnley, in which the plaintiff, Mr. Robert Jackson, farmer, sought to recover damages for the alleged seduction of his daughter whilst under the influence of nitrous oxide. There was also a cross action for slander brought against the plaintiff. The trial occupied nearly three days.

His Lordship, in summing up, said the one substantial issue for the jury was, did James Jackson, the dentist, or did he not, administer gas or some narcotic to the young woman, Margaret Ann Jackson, and did he, while she was under the influence of some anæsthetic, criminally assault her? That was the question they had to determine, and it was a question of the very gravest moment. The consequences to the one side or the other must necessarily be of the most serious character. The charge which was made against the dentist was one of assault under circumstances of the most aggravated and

and nefarious nature. The charge, on the other hand, of which the woman would be guilty, if she had made a false accusation, was one of the most wicked, odious, and vile that could be brought by one human being against another. The case was one of a most extraordinary character, and one which, he was happy to think, was very rarely raised in a court of justice. It was one which demanded at the hands of the jury, as he knew it would most assuredly receive, their deepest and most anxious attention, so that to the utmost of their ability they might do justice between the parties. He did not hesitate to say that the question was of an extremely difficult character; but it was one which he was confident the jury would, using their own good sense, solve to their thorough satisfaction; and if they did solve it to their satisfaction it should be satisfactory to all well-minded people. He would say nothing about damages, because it was unnecessary. The parties probably were none of them in position to pay damages. That, however, was utterly unimportant, and should not affect the amount of damages. It was unnecessary for him to say a word about damages, because he should not venture to put any limit upon the damages which they might award to either one side or the other.

The jury retired to consult on the case, and after deliberating for three hours, returned to court and stated that there was no possibility of their coming to an agreement. The Judge thereupon discharged them.—*Dental Record*.

THE FLUCTUATIONS IN COCAINE.—Notwithstanding the fact that the consumption of cocaine is steadily on the increase, and that remarkable progress has been made in its introduction as a local anæsthetic, prices having declined just as rapidly and even now there is a perceptible weakness about the market which forebodes lower values. The precipitation of values is owing principally to competition in its manufacture and the decline in the price of leaves. The discovery of cocaine is scarcely two years old and the furore created at the time has spread to the uttermost parts of the earth. It had many enemies, like other new articles, but no remedial agent ever received so

much abuse as cocaine, which has fortunately reacted on its defamers to the added popularity of this drug. When first brought on this market it sold for two dollars and a half per drachm, then advanced to ten dollars, and the free advertising it received through the medical press attracted the attention of American chemical manufacturers who were not slow in appreciating its importance in the medical world. One after another started to produce cocaine muriate and the field is now occupied by five manufacturers. The largely increased production tended to cheapen the article, and this had the natural effect of increasing its consumption, although the merits of cocaine are alone sufficient to make its use universal, but more sparingly, if the high figures ruling at the start had continued. The market at present is quoted at eleven to twelve dollars per ounce for bulk.

Manufacturers are surprised at the success of their venture. They characterize its sale as being something "wonderful" and the movement has kept up unchecked, with the prospects promising of continuing so.—*Drug Reporter*.

MR. JONATHAN HUTCHINSON believes that there is no reason to think that the transmission of syphilis is ever a thing of less or more, but rather that if a child inherits any taint it inherits the whole malady; the varying degrees of severity are to be explained in the same way as we explain the differences observed when scarlet fever is passing through a community. He adduces the hypothesis of M. Parrot that rickets is due to syphilis, and sees no reason why syphilis and rickets should not mix. The question as to whether deep ulcerations of palate and pharynx, when met with in young persons, are usually due to syphilis or to scrofula, evidence pointed strongly to the conclusion, in Mr. Hutchinson's opinion, that syphilis was chiefly responsible for such ulcerations.—*Dental Advertiser*.



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